

# ENTERPRISE DEVELOPMENT: SME GROWTH THROUGH E-BUSINESS

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## **Abstract**

The opportunity for SMEs growth through its use of e-b/c has long been advocated by government, practitioners and academics. This research identifies the opportunities, benefits and impact of developing a e-business/e-commerce framework/tool for this. It reviews e-business/e-commerce definitions, driving forces, initiatives, uptake, progress, barriers, success factors, models, strategies and best practice. It also reviews the characteristics and the importance of small and medium sized enterprises and their impact on the economy. In addition, the research explores the purpose and use of benchmarking and self-assessment tools for improving business performance.

The research identified similarities and differences between small, medium and large companies. Due to the differences in nature and best practice strategies adopted by larger companies may prove to be unsuitable and impractical for smaller companies to follow. Through a number of case studies the research identified that the current e-b/c activity level is very low amongst SMEs (studied firms were mainly based in the Merseyside region), therefore e-b/c system integration appears to be an unrealistic target for the vast majority.

Although there is no pattern or formula for e-b/c success, it is possible to evaluate the level of e-activity in each main business area to reflect the level of systems integration, and also to evaluate their e-b/c involvement and key actions for growth. The research identified that e-b/c success is driven by business needs, supported by ICT competence and executed by actions based on priorities. More importantly, a range of critical success factors that may have significant influence over e-b/c adoption and development were also identified. Certain factors can be advanced in order to improve a firm's overall e-b/c performance whereas other factors cannot be improved within a short time frame.

The key findings of the research contribute to the current body of knowledge by identifying a set of enabling factors that may potentially influence an SME's capability to be successful in e-b/c adoption and development. It exposed a range of specific (fixed) factors which are typically difficult to implement within SMEs. In contrast, variable factors have the potential to be improved. Eight variable factors were specifically highlighted, forming a unique '8 dimensions factor' model and subsequently used as the basis for a proposed e-b/c self assessment framework. The research confirms that it is feasible for the e-b/c self assessment tool to be implemented and validated for commercial purposes and it could be specifically tailored for a business sector or country. The research outcomes set a natural scene for future research in a wider and global context, encompassing additional business sectors and global companies.

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# Contents

<b>Abstract.....</b>	<b>i</b>
<b>Acknowledgments.....</b>	<b>iii</b>
<b>Contents.....</b>	<b>v</b>
<b>List of Figures.....</b>	<b>ix</b>
<b>List of Tables.....</b>	<b>x</b>

## **Chapter 1: Introduction.....1**

- 1.1 Research Background and Motivation
- 1.2 Introduction to the Research Programme
- 1.3 Research Aims and Objectives
- 1.4 Research Problem and Hypotheses
- 1.5 Research Methodology
- 1.6 Scope and Limitations
- 1.7 Thesis Structure and Content

## **Chapter 2: Literature Review.....13**

- 2.1 Introduction
- 2.2. E-Business/Commerce in the SME Context
  - 2.2.1 E-business/commerce definitions
  - 2.2.2 E-business vs. e-commerce
- 2.3 Significance of E-Business/Commerce in SMEs
  - 2.3.1 SMEs: small firms' characteristics
  - 2.3.2 Importance of SMEs

2.3.3 E-business/commerce impact in SMEs	
2.4 Overview E-Business/Commerce Initiatives, Uptake and Progress in the UK	
2.5 Benefits of E-Business/Commerce in SMEs	
2.6 Barriers to E-Business/Commerce in SMEs	
2.7 Success Factors of E-Business/Commerce in SMEs	
2.8 E-Business/Commerce Models and Integration	
2.9 E-Business/Commerce Strategies in SMEs	
2.10 E-Business/Commerce Best Practice	
2.11 Benchmarking and Self-Assessment	
2.12 Summary and Conclusions	
<b>Chapter 3: Methodology.....</b>	<b>64</b>
3.1 Introduction	
3.2 Philosophical Approach to Methodology	
3.3 Mixed Methods Approach to Research	
3.4 Research Process and Methods	
3.4.1 Research process	
3.5 Research Population	
3.6 Limitations of the Methodology	
3.7 Summary	
<b>Chapter 4: Initial Investigation.....</b>	<b>85</b>
4.1 Background of Initial Investigation	
4.2 The Greater Merseyside Broadband Project	

4.2.1	Introduction	
4.2.2	Survey results	
4.2.3	Interview results	
4.2.4	Summary	
4.3	Critical Issues for Future Development	
<b>Chapter 5:</b>	<b>Questionnaire Analysis and Results.....</b>	<b>94</b>
5.1	Introduction	
5.2	Questionnaire Methodology	
5.2.1	Rationale for use of a questionnaire	
5.2.2	Questionnaire content	
5.2.3	Sample: nature, size and response rates	
5.2.4	Questionnaire preparation and conduct	
5.3	Analysis Techniques and Data Types	
5.3.1	Introduction to the analysis techniques	
5.3.2	Results, analysis and discussion	
5.4	Summation of Analysis	
<b>Chapter 6:</b>	<b>Case Studies.....</b>	<b>123</b>
6.1	Introduction	
6.2	Aims and Objectives	
6.3	Rationale of Case Studies	
6.3.1	Case study design	
6.3.2	Company selection	
6.4	The Case Studies	



6.4.1	Main findings from each case study	
6.4.2	Summarised findings from the case studies	
6.5	Summary of fixed and variable factors	
6.6	Case Study Analysis	
6.6.1	Summarised factors scoring table	
6.6.2	Cross case analysis	
6.7	Summary of Analysis	
<b>Chapter 7:</b>	<b>Development of E-b/c Self-assessment Framework/tool...</b>	<b>164</b>
7.1	Initial proposal of e-b/c self-assessment framework	
7.2	Development of practical implication	
<b>Chapter 8:</b>	<b>Analysis and Discussions.....</b>	<b>187</b>
8.1	Discussion of key research findings	
8.2	Discussion of hypotheses	
<b>Chapter 9:</b>	<b>Conclusions.....</b>	<b>204</b>
<b>Chapter 10:</b>	<b>Future work and recommendations.....</b>	<b>210</b>
<b>References.....</b>		<b>212</b>
<b>Appendices.....</b>		<b>235</b>
<b>Glossary.....</b>		<b>402</b>

# List of Figures

Figure 2.1 The conceptual model of e-business success

Figure 2.2 Stage of e-commerce development and their characteristics

Figure 2.3 'Bricks and Clicks'

Figure 2.4 Benchmarking e-readiness using a 5-point scale

Figure 3.1 Conceptual research Methodology Model

Figure 3.2 Research process and methods

Figure 7.1 E-b/c self-assessment framework

# List of Tables

Table 2.1 SME e-b/c adoption rate of selected countries in 2001

Table 2.2 E-business adoption within a size-band (%)

Table 2.3 Benefits of e-business uptake

Table 2.4 A list of literature on e-business models

Table 2.5 DTI e-b/c adoption ladder

Table 3.1 Summary of the stages of research, purpose, methods and sample organizations used

Table 4.1 Characteristics of firms in Merseyside

Table 5.1 Firms' characteristics: small vs. large firms

Table 5.2 Firms' characteristics: manufacturing vs. service firms

Table 5.3 Most frequent e-b/c level in each business area

Table 5.4 Percentage of highest e-b/c level based on size and sector

Table 5.5 Mean scores: e-b/c awareness vs. practice

Table 6.1 Brief description of studied firms

Table 6.2 Summarised factors scoring framework

Table 6.3 Influence of age

Table 6.4 Size vs. integration

Table 6.5 Service orientation and product nature

Table 6.6 Insignificant supply chain impact

Table 6.7 Overall performances

Table 6.8 Critical of ICT capabilities

Table 6.9 Importance of website

Table 6.10 Importance of web-marketing

Table 6.11 Customer relationship management

Table 6.12 Importance of e-vision and goals

Table 6.13 Importance of internal communication

Table 6.14 Insignificant impact of resource management

Table 7.1 5 Stage e-b/c integration model

Table 8.1 Differences between small and large firms

## CHAPTER 1 INTRODUCTION

### 1.1 Research Background and Motivation

The Technology Management Group (TMG) in the School of Engineering at Liverpool John Moores University established the Merseyside Small Medium Enterprise (SME) Development Centre (MSMEDC) in 1997. The group has been conducting research into a wide range of business activities in SMEs (Small Medium Enterprises) including enterprise development, supply chain management, complexity of new product development, e-b/c (e-business/e-commerce) implementation, knowledge management and computer aided innovation. To date, the MSMEDC has worked with over 600 SMEs across various industries, mainly in the area of SME management systems to assist their business growth. The centre aims to:

- support the growth of Merseyside SMEs
- develop tools/methodologies for use by SMEs and business support providers
- conduct applied research into SME growth

Ninety nine percent of enterprise for British industry is made up of SMEs (DTI, 2003; Curran & Blackburn, 2001; Humphries, 1997), which indicates the success of the UK economy heavily depends upon the success of the SME sector. Each company tries to be successful in its own way, however, the exact definition of success is understood differently by each firm, for example, profitability, growth, customer service, staff loyalty etc. Adding value through business process development is the foundation to business success, thus, success in business areas including marketing, customer service, sales, resource management, purchasing, communication and collaboration are vital.

In order to help SME growth in the Merseyside region, an applied research programme that focussed on Supply Chain Management (SCM)

Systems was undertaken by the Centre between January 2001 and December 2003. The aim was to develop a quick and simple framework/tool to assess SMEs against supply chain best practice and how e-b/c could be used to support business growth. This was achieved by working with 100 supply chain leaders to define best practice criteria across ten operational areas. The resultant best practice assessment tool (Barclay and Porter, 2005) is now used within every company that works with the MSMEDC.

One of the ten operational criteria was Information Communication Technology (ICT)/e-business usage. This showed that e-b/c potential was not properly understood, and certainly not well used by the Merseyside SMEs, although it has been recognised as a powerful business tool by many researchers, academics, enterprises and the commercial world.

In 2002, one of the most important government targets was to have 1.5 million SMEs online. Therefore it may be clearly seen that continued and more focused research on business growth through the use and development of e-b/c is urgently needed. The European Commission has identified the fact that SMEs are major users of ICT and the Internet; they are primary contributors to the economy. "At the Lisbon summit in March 2000, the European Union representatives set the goal of becoming the world's most dynamic and competitive knowledge-based economy by 2010" (eEurope Go Digital, 2002).

To achieve this goal the representatives recognised the need to promote an 'Information Society for All', and to address the issues of the digital divide in the adoption of Internet and e-business and its use (eEurope, 2005). Support for this objective in the UK may be seen in the Small Business Service's intent of "making the UK the best place in the world to start and grow a business" (DTI, 2004).

The DTI figures show that we have a long way to go to achieve this aim, as British SMEs are no better than average in the European Union (EU) for use of e-b/c by small firms and in particular very small firms with less than ten employees. The failure rate of e-b/c is high in SMEs even though it is recognised as an effective business strategy (Paul and Franco, 2001). Most SMEs are still fighting to survive with limited resources, finance, knowledge and skills as they aspire to be successful. Thus any ICT based intervention should relate to what each SME considers to be success in terms of using e-b/c as a part of a growth strategy. This led to the conclusion that to engage appropriately and effectively in e-b/c usage in SMEs it would be better to set priorities for the business activities according to their business needs.

## **1.2 Introduction to the Research Programme**

A three year research project (e-b/c for SME growth) was developed from June 2004 as a part of Liverpool John Moores University Technology Management Group's research activities. It focused on investigating low-tech SMEs who wanted to, or who had adopted e-b/c as a part of a business strategy for growth. Every SME has its own way to approach e-b/c for success. Ideally, different methods of implementation, training and support are required for the different SMEs in specific sectors. However, explicit guidance for each SME is not practical because of the population of SMEs in the UK. Regardless of the differences in SMEs, identifying a range of critical factors that improve business performance and helping business success on a generic base are vital to the research. Six sectors i.e. manufacturing, hotels and restaurants, telecommunications, retailers, wholesalers, banks and insurance and other services, which are likely to need help with e-b/c for growth were selected for the research programme in order to produce a generic self-assessment frame for SMEs in business. It will allow SMEs to effectively assess their current business performance and the e-b/c capability and also provides the direction to business growth success. This was achieved through

investigating approximately 100 SMEs at different phases of research through the whole project.

It was obvious that there were a number of practical benefits to be gained from this research. The first of these would be a number of useable 'success' definitions provided by SMEs using e-b/c rather than the plethora of opinions available through the literature surrounding the subject. This would provide focus upon what exactly e-b/c can achieve in terms of SMEs' business performance. The second benefit would be to identify a range of factors that support/hinder e-b/c adoption and development in SMEs which would not only help SMEs to increase the e-b/c awareness but would also lead to more effective support/guidance from business support agencies. The third benefit would be an easy to use self-assessment framework or tool which would help many SMEs improve their e-b/c performance for business growth.

This research relied on both theoretical and practical work with SMEs. It started with gaining a basic understanding of SMEs' business process issues and then aimed to suggest a course of action supported by theory.

It was decided that it would be best to look at how e-b/c can help business performance in the areas of marketing, customer service, sales, resource management and internal communication in terms of growth. This is achieved by designing and developing e-activities/applications that are based on business needs and priorities, and then integrating different stand-alone e-applications together gradually. Existing e-enterprises face a variety of barriers that are the reasons for e-b/c failure, for example cost, resource, business changes, managerial attitude, technical difficulty, strategy, security, e-b/c capabilities, ICT expertise and skills. Within the field of SMEs, investigating e-b/c, the examination of success factors and effective strategies is vital to the whole research work. Most past research has concentrated on specific areas considered crucial to success such as web-marketing, online-trading, e-customer service, e-procurement and e-resource management.



The initial investigation was carried out with SMEs mainly in the Merseyside region to cover areas such as:

- Use of Internet Technologies
- Impacts of Internet Technologies
- Driving forces for e-b/c
- Barriers to doing business on the Internet
- Management of e-b/c ventures
- Future plans for e-b/c
- Key management issues

There were many barriers as well as benefits for SMEs in e-b/c through an initial exploration of the subject. Exploring and identifying the obstacles, the success factors and strategies have become the main priorities in this research project. Therefore, it was important to cover the following aspects for the research project.

- E-B/C awareness
- E-Capabilities
- E-B/C implementation models or frameworks.
- Business and e-b/c Strategies.
- “Good practice” of e-b/c in SMEs.
- E-B/C critical success factors in SMEs.
- Existing e-b/c assessment framework or tools.
- Existing e-b/c models.

This research aimed to produce a generic easy to apply e-b/c framework/model to all sectors based on a set of critical success factors. If used correctly, it will enable business support agencies and SMEs themselves to quickly pinpoint the key features of their business. Therefore, it will help SMEs to prescribe a course of appropriate actions.

### 1.3 Research Aims and Objectives

Research aims and objectives can be summarised as follows:

The research project aimed to:

1. produce an easy to apply framework or tool for e-b/c development and implementation
2. encourage e-b/c adoption and development in SMEs
3. raise and promote e-b/c awareness in SMEs
4. advise and support SMEs in e-b/c

The objectives are to:

1. justify the need for the research through literature review.
2. define SME e-b/c drivers, benefits, barriers, elements, core competencies and relevant good practice and strategies.
3. investigate a wide range of support and hindrance factors which might influence the success of e-b/c adoption and development.
4. “measure” these factors in order to assess a firm’s e-capabilities.
5. define e-b/c best practice criteria in general terms.
6. review existing e-b/c models.
7. review existing e-b/c assessment frameworks or tools.
8. define and develop a generic framework or model whereby firms can evaluate their e-b/c performance and determine improvement programmes based on their specific business needs.

### 1.4 Research Problem and Hypotheses

The research problem addressed in essence:

*“How can we help SME business growth by the adoption and development of e-business/e-commerce?”*

There are a few large consultant companies helping firms to grow by implementing their e-b/c performance through self-assessment tools or frameworks, but these are complicated and may only be useful to large firms. However, there are no self-assessment tools or frameworks specifically for SMEs, which implies innovative and easy-to-apply methods are needed especially for SMEs. One of the outcomes of this research project was to produce an easy-to-apply self-assessment framework or tool that can be used to increase a company's awareness of its current business situation or e-b/c performance and provide the roadmap for future improvement.

The initial investigation and the literature reviews showed that SMEs need e-b/c to help with their growth and business success, but there are many barriers and issues obstructing its adoption or development. The survey, research and interviews with the companies showed that e-b/c certainly can be used to achieve business success in SMEs but appropriate actions needed to be taken in identifying and achieving the critical success factors.

The following hypotheses were generated following this phase of research starting from a general hypothesis which was expanded to a set of sub-hypotheses:

**General Hypothesis:**

*Regardless of a firm's size, age, service orientation, products complexity and supply chain pressure, it is possible that its e-business/e-commerce capabilities can be assessed in overall terms by the application of a model which in turn could form the basis of an improvement process/methodology.*

**Sub-Hypotheses:**

*H a: There are likely to be significant identifiable differences between larger firms and smaller firms in terms of e-activities capabilities, motivation for development, integration and priorities for action.*

*H b: SMEs are less likely to have integrated or advanced e-b/c systems. The SME's view of business growth success (and its measurement) may not necessarily be linked to the level of e-activity integration.*

*H c: It may be possible to evaluate the level of e-activities in each main business area to reflect the level of systems integration, and also evaluate their e-b/c involvement and key actions for growth.*

*H d: It is possible to identify the factors that support/hinder e-b/c adoption and development in SMEs.*

*H e: The success of e-b/c most likely depends on a set of enabling factors that may potentially influence an SME's capability to adopt good/appropriate practice in e-activities. Such factors may be used as the basis of simple self-assessment tool that an SME could use to improve its performance.*

*H f: It may be possible to detect some specific factors which can be shown to have significant impact on the success of e-b/c adoption and development, but which may not be easily addressed or implemented within SMEs.*

**1.5 Research Methodology**

A mixed research methodology (both qualitative and quantitative techniques) was used through the whole process. This is discussed in Chapter 3 in detail. A chapter is devoted to this subject later in the thesis.

The research process was grouped into two phases that including seven stages as follows:

Phase 1: Initial Exploration

Stage 1: Entry stage

Stage 2: Exploring stage

Stage 3: Initial investigation stage

Phase 2: Practical Research

Stage 4: Testing stage

Stage 5: Investigating stage

Stage 6: In-depth study stage

Stage 7: Finishing stage

Methods used are as follows:

1. Literature reviews to gather e-b/c relevant information and aspects especially the e-b/c support/hinder factors and justify the research;
2. Surveys to explore and evaluate e-b/c characteristics in SMEs and relationship between e-b/c critical success factors and their significant impact on e-b/c good practice;
3. Mini case studies that converted from semi-structured interviews to verify and extend a range of e-b/c factors, to test the e-b/c critical success factors.

These are discussed in greater depth in Chapter 3.

## **1.6 Scope and Limitations**

The initial focus of the research was on a population of SMEs across the UK, but the majority of respondents were from Merseyside region. The low response from SMEs across the UK are due to a number of reasons as follows:

- Geographical barrier

- Confidential policies in most SMEs
- Time pressure from businesses
- Limited manpower and limited resources

However, most of the participating sample companies had local knowledge and willingness, which had certain advantages in data collection and accuracy and interviews in the later stage.

The research project initially aimed to produce a generic self-assessment framework or tool for companies willing to adopt or develop their e-b/c. All sample companies were selected from six sectors initially according to “SIC codes 20-89” which are more likely to adopt or develop their e-b/c than other sectors, but the participating sample companies were mainly dominated by service and manufacturing companies throughout the whole research rather than more specific sector focused. The outcomes from the research project might have its limitation in other sectors.

Other researchers might investigate the research problems in a different way with their own expertise areas and research styles; this could lead to diverse outcomes and knowledge back into the research project.

Considering the broad spectrum covered in the research project, it was too broad scope for a single researcher to carry out in-depth research from each angle within the time available. A generic self-assessment framework for SMEs in e-b/c was only proposed in the end of the research project as one of the significant outcomes.

## **1.7 Thesis Structure and Content**

**Chapter 1** provides an introduction to the research programme and describes the main thrust of the research project.

**Chapter 2** is a review of the literature on a wide range of elements and aspects that relate to e-b/c and its development e.g. e-b/c benefits, barriers, strategies, good practice, facilitators, driving forces, implementing models, existing assessment tools etc.

**Chapter 3** describes the research methodology. This includes a description of the research population in terms of size, sample frame and key stages of the research. It covers research purpose, methods and sample selections used, and also gives a detailed justification of methods and samples.

**Chapter 4** provides a snapshot of current e-b/c activities in Merseyside SMEs through an initial exploration of the research problem based on the Greater Merseyside Broadband Project. The results show the benefits and barriers of e-b/c adoption and development. Current levels of e-b/c integration were identified.

**Chapter 5** explains the design and development of the questionnaire, which extended from a pilot survey for the Greater Merseyside Broadband Project. Fifty one companies participated and the results of the questionnaire are presented, analysed and discussed in this chapter. This focuses on the awareness of e-b/c, current practice, current integration levels and the relationship between e-b/c success and its support and hinder factors. Through the analysis, some valuable correlations between variables were discovered and discussed.

**Chapter 6** provides the practitioners' view of e-b/c current involvement and development through a series of case studies converted from semi-structured interviews. The results provide qualitative information on how these firms use and develop e-b/c for the improvement of business performance. The case studied firms are also assessed against a set of e-b/c critical factors for an in-depth cross case studies analysis.

**Chapter 7** discusses the development of an e-business implementation model/framework which is based on the research results drawn together from literature, surveys, practical work, case studies and peer discussion. It proposes a generic self-assessment tool for assessing, improving and developing e-b/c in SMEs, and also demonstrates the practical applications which were carried out in two pilot SMEs.

**Chapter 8** gives summarised analysis based on literature review, questionnaire, interviews and case studies. It also reviews the research work and discusses how the work has satisfied the research aims, objectives and hypotheses.

**Chapter 9** concludes the whole research project from original research problems to research outcomes and hypotheses which are based on the key findings from each stage of research work.

**Chapter 10** explains how further work could be carried out to improve the project's validity and complexity. It also discusses the recommendations of the future developments in e-b/c for SMEs in a wider and more practical context to comply with the limitations of the current research work.



## CHAPTER 2: LITERATURE REVIEW

### 2.1 Introduction

Creswell (1994) cites that the literature review in a research study accomplishes several purposes: (a) It shares with the reader the results of other studies that are closely related to the study being reported (Fraenkel and Wallen, 1990); (b) It relates a study to the larger, ongoing dialogue in the literature about a topic, filling in gaps and extending prior studies (Marshall and Rossman, 1989); and (c) It provides a framework for establishing the importance of the study, as well as a benchmark for comparing the results of a study with other findings.

This is a three year applied research programme which has been carried out into e-business/e-commerce (e-b/c) adoption and development in SMEs that started in June 2004. As a starting point for the work, an intensive literature search and review was conducted (from books, journal papers, industrial articles) by using various online search engines, digital resources, journal reference sources and library systems. This search identified more than 100 papers in the past five years that had clear relevance to the aims of the research project. There were 20 key papers that considered the major issues, benefits and strategies for implementation of e-business in SMEs. These were reviewed in detail for the purpose of the applied research programme. The literature review covers a wide range of specific areas of research interest as follows:

- Definitions of e-business and e-commerce
- E-Business vs. e-commerce
- Small firm characteristics
- Importance of SMEs
- E-business/commerce impact in SMEs
- Overview e-b/c initiatives, uptake and progress in the UK

- Benefits and barriers of e-b/c in SMEs
- Success factors of e-b/c in SMEs
- E-business/e-commerce models and integration
- E-business/e-commerce best practice including strategies in SMEs
- Benchmarking and self-assessment for SMEs in e-b/c

The nature of this literature review is not to look at the problems faced by a specific industry, the above areas have been studied thoroughly to identify all aspects that are involved in e-b/c activities in SMEs across many industries in a generic sense. The research project examined how e-b/c is being used in SMEs in order to be more competitive amongst rival firms.

## **2.2 E-Business/E-Commerce in the SME Context**

### **2.2.1 E-business/e-commerce definitions**

**E-Business definitions:** Ramsey et al. (2003) adopt the term electronic business in a broad fashion, and use it interchangeably with e-commerce and Internet commerce in describing business activities and processes conducted via the Internet. Ahlstrom and Nilsson (2003) use 'e-business' to describe how corporations utilise information technology to conduct business and achieve competitive advantage. Fillis and Wagner (2005) identify e-business as any business carried out over an electronic network that exchanges data files, having a website, using other companies' websites or buying and selling goods and services online.

There are many definitions of e-business, but they all imply some manner of electronic operation for business transformations.

IBM originated the concept of e-business in October 1997 and also identified e-business as the following:

“The transformation of key business processes through the use of Internet technologies” (Smith et al., 2001).

Its definition was further refined by the Gartner Group (1999). Gartner’s e-business definition is:

“the optimisation of a firm’s business activities through digital technology.”

The DTI (2000a) describes e-business as:

“When a business has fully integrated information and communications technologies (ICTs) into its operations, potentially redesigning its business processes around ICT or completely reinventing its business model...e-business is understood to be the integration of all these activities with the internal process of a business through ICT.”

Strowbridge (2000) suggests that e-business is when a company uses electronic information to improve performance, create value and enable new relationships between businesses and customers.

There are many more definitions of e-business but those emphasising the fact that the ICT technologies are being used to extend and/or develop business systems within a strategic business framework are most appropriate for this research. The key aspect of any relevant definition is that whilst technologies may open new business opportunities, they must be developed for commercial/business reasons.

E-business is a new way of doing business for SMEs and is an evolution of

successful business systems. It is already well established and is impacting every industry. It affects the whole business community and the value chains through the business process and managerial operations. E-business also enables a more integrated level of collaboration than ever before, bringing added strength and functionalities to deliver products or services and complex projects in an increasingly competitive marketplace.

In order to improve business performance, e-business can benefit from new opportunities and capabilities that strategically transform the generic business model and operations in an electronic form. It is a useful tool to help SMEs eliminate geographical and time restrictions for doing business and help to explore possibilities for business growth.

Kalakota and Robinson (2001) stated that e-business is the overall strategy of redefining old business models with the aid of technology, to maximise customer value and profits. “Forget B2B or B2C, e-business is about P2P-path to profitability” (Krishnan, 2002). E-Business is not just about electronic transactions or about buying and selling over the Web; it is much more than the purchase and implementation of computer applications. The wide impact of e-business must be managed as an integrated change process (people, processes, information management and technology).

**E-Commerce definitions:** E-Commerce (known commonly as electronic commerce) has revolutionised nearly every industry in the world. It appeared in the early to mid 1990s and fast became a common term. Bandyo-Padhyay (2002) describes e-commerce as using computer networks to transfer some of the business processes to electronic forms. By utilising links with the computer systems of their trading partners, organisations communicated electronically to achieve fast, inexpensive and reliable business transactions.

Poon and Swatman (1999) base their research on the definition by Zwass (1994), describing Internet commerce as the sharing of business information, maintaining business relationships, and conducting business transactions by means of Internet-based technology.

E-Commerce represents the front end of a business and its visible interactions with customers (Albert and Sanders, 2003). It certainly achieves trading online as a new channel to generate sales by using technology. The business process is simplified; interactive customer service is also created by involving e-commerce.

Chaffey (2002) also states that e-commerce refers to all types of electronic transactions between organisations and stakeholders whether they are transactions or exchanges of information or their services. These e-commerce transactions are either buy-side e-commerce or sell-side e-commerce.

E-Commerce is often thought as simply buying and selling online. However, e-commerce is more than this. It is a complete business strategy that offers a range of services and opportunities for electronic trading globally (Lawson et al., 2003). For example, Chaffey (2002) cites that e-commerce refers to any activity which involves enterprises interacting and doing business with customers, with each other or with administrations by electronic means. It includes electronic ordering of goods and services which are delivered using traditional channels such as post or couriers (indirect electronic commerce), online ordering, payment and delivery of intangible goods and services such as software, electronic magazines, entertainment services and information services (direct electronic commerce), electronic fund transfers, electronic share trading, electronic bills of lading, commercial auctions, collaborative design and engineering, online sourcing, public procurement, direct consumer marketing and after-sales service.

Kalakota and Whinston (1997) view e-commerce as the buying and selling of information, products and services via online computer networks. The Cabinet Office (1999) extends the previous interpretation to also include email and Intranets in the exchanging of information within the firm and with external stakeholders.

### **2.2.2 E-business vs. e-commerce**

It should be noted that there is a difference between e-business and e-commerce in terms of business benefits, extent of organisational change and sophistication in that e-commerce is part of e-business (Searle, 2001). E-Commerce is frequently confused with e-business, but it clearly refers directly to the transaction or the sale made through electronic process (Albert and Sanders, 2003). The literature shows that the distinction between the terms e-business and e-commerce is often blurred. However, Strauss and Frost (2001) clearly state that e-commerce is a part of e-business' five major components.

Many researchers e.g. Hinson and Sorensen (2006) and Chaffey (2002) agreed that the viewpoints of the relationship between e-commerce and e-business can be used and expanded as follows:

- E-Commerce is broadly equivalent to e-business particularly to those companies where trading online is their only core business (Jelassi and Enders, 2005).
- There is a relatively small overlap between e-commerce and e-business because of the common characteristics in them and similar activities involved in both e-commerce and e-business (Chaffey, 2004; Turban et al., 2006).
- E-Commerce is a subset of e-business especially in manufacturing companies where customer relationship management, supply chain

management and resource planning are equally important as selling products (Chaffey, 2002; Jelassi and Enders, 2005).

Most definitions of e-business imply integrated and relatively sophisticated systems which facilitate business process electronically and automatically. They are regarded as showing a distinct separation from e-commerce (stand-alone e-business applications applied in specific business areas or business activities through different electronic means). The differences between e-commerce and e-business might not be fully understood in most SMEs.

Pavic et al. (2007) cited the difference between e-commerce and e-business is “while e-commerce focuses primarily on transactions with a firm’s customers, e-business expands the connectivity of the organisation to include its suppliers, employees and business partners”. In fact, a range of e-commerce activities were adopted according to the business needs during the different stages of e-business implementation. Thus for the purpose of this applied research programme, the definition of e-b/c not only covers the full panoply of ICT based business systems that have a presence outside of the company, but also concentrates on ICT used and developed for e-b/c activities based on the business needs.

### **2.3 Significance of E-Business/E-Commerce in SMEs**

#### **2.3.1 SMEs: small firms’ characteristics**

The EU defines the micro-organisation as employing up to 9 staff, the small enterprise having 10 to 49 employees and the medium-sized enterprise having 50-249 employees. Storey (1997) states that around ninety five percent of all firms in the EU are small firms, providing more than half of job opportunities. Many SMEs occupy niche markets and offer a specialised

service or product, competing with some large companies in the same industry.

Storey (1997) identifies three key areas where small firms differ from large firms:

(1) Uncertainty: small firms tend to have a limited customer base, product line and resources. There is a diversity of owner-vision and attitude towards the future business. Many owners/managers are happy with their current business performance and only wish to maintain the current size once they can achieve a certain level of income.

(2) Innovation: small firms occupy the niche markets as one of the significant competencies that challenge the large firms and also simulates the product diversity through innovation. Some small firms grow fast through innovation.

(3) Evolution: small firms are more likely to evolve and change than the large firms, perhaps due partly to the existence of a more flexible organisational structure, business model and culture within the firm.

Murphy and Ledwith (2007) state that SMEs exhibit both advantages and disadvantages when compared to larger organisations. Many SMEs have a greater potential flexibility and closeness to the customer and an edge towards customisation and innovation. They seek out markets where their advantages count and they are not in direct competition with their larger counterparts. SMEs also exhibit behavioral features that give them an innovative advantage over large firms. These include the ability to respond rapidly to external threats or opportunities, more efficient internal communications and interactive management cycles. Crick et al. (2006) state that many SMEs, particularly in manufacturing and service sectors, are family owned and engaged in overseas markets. The characteristics of



SMEs open up many possibilities and opportunities to adopt new ways of doing business, certainly e-b/c is recognised by the UK government and business support agencies as a tool to compete with large firms. However, SMEs lack of awareness, skilled employees (Saulles, 2007), technological competencies (Rothwell, 1992) and also have limited access to resources and managerial skills (Crick et al., 2006) which raise the challenges for adopting and developing e-b/c.

### **2.3.2 Importance of SMEs**

As early as 1969 it was recognised that “the small firm sector is the traditional breeding ground for new industries and innovation” (Boswell, 1972). This was restated some time later by Schreyer (1996) from OECD who also recognised that the dynamism of SMEs made an important contribution to the creation of new jobs, the economic revival of certain regions and also to technological progress. SMEs have an important role to play in a country’s economy (Beaver, 2002) and globally they contribute eighty per cent to a country’s economic growth (Bodorick et al., 2002).

eEurope Go Digital (2002) states SMEs generate a substantial share of European GDP and they are a key source of new jobs as well as a fertile breeding ground for entrepreneurship and new business ideas. “There are 19 million SMEs in the EU and in most EU Member States they make up over ninety nine percent of SMEs. It was also reported by the DTI that those companies had less than 100 employees” (Humphries, 1997). Similar evidence can be put forward for the UK. Dixon et al. (2002) states “The 3.7 million SMEs in the UK produce forty percent of GDP, and have an annual turnover of approximately one trillion pounds. Employing 12 million people, they account for some fifty five percent of the private sector workforce”. Further breakdown of these figures has revealed that “less than one percent of all businesses in the UK are not small or micro businesses” (Curran and Blackburn, 2001).

Saulles (2007) cited that at the end of 2005, over ninety nine percent of all UK enterprises were SMEs, which contributed fifty one percent to the total turnover and they accounted for fifty eight percent of total UK employment. "SMEs are, therefore, clearly an important part of the UK economy, a factor that has long been recognised by successive governments" (Saulles, 2007 p2).

It can be seen that SMEs are key business performers, innovators and evolutionists in the modern world. A dynamic small business community is central to enterprise in the UK. Small and medium sized businesses are the backbone of British economic life. "In the United Kingdom, for example, ninety nine percent of the 3.7 million enterprises employ fewer than 50 people, there are only 3,500 with 500 or more employees" (Bannock, 2005). SBS (2002) claims that the success of the UK economy relies increasingly on the success of the small firms and it is vital that both public and private sector initiatives continue to support and encourage the establishment of new firms and their survival.

On a global level the companies from developing countries are benefiting from markets that encourage innovation, quality, service and price competitiveness. Technological breakthroughs and ICT advantages are enhancing SME competitiveness into both national and global markets. All countries now recognise that the SME sector is the "life-blood" of the whole economy and that the success of SMEs ensures the health of the local, regional and national economies.

### **2.3.3 E-business/e-commerce impact in SMEs**

E-business/e-commerce could profoundly impact on organisations in different ways (Al-Qirim, 2004). E-b/c introduces unprecedented innovations

and business models that were not possible before the emergence of the Internet. Based on considering the importance and business performance of SME and the impact to UK economy, the UK government encourages SMEs not to miss the opportunities offered by ICT and e-b/c to raise productivity and to foster innovation (eEurope Go Digital, 2002).

Riggins (1998) introduced a grid where various opportunities could be identified from the web based on the strategic orientation of organisations. For example, the automation of internal systems and processes within organisations are facilitated through a wide range of e-b/c applications.

SMEs have limited resources compared to large multi-nationals. Many of them cannot afford resources such as regional and overseas representatives and offices when looking to expand their businesses into new markets both nationally and internationally. E-business/e-commerce operations can provide solutions to these problems at an affordable price and in a controllable way.

Hinson and Sorensen (2006) state that e-b/c pressed legal environment, education and skills to support ICT development and deployment, the adoption of e-government and e-governance. In addition, the export growth led by e-b/c enlarged consumers' accessibility to a diverse set of goods and service, improved the standard of living and quality of life and increased the national development and competitiveness (Lages and Motgomery, 2004), which caused the need for the latest telecommunications technology. E-business/e-commerce was also recognised as a key enabler to achieve 12 billion SMEs with non-traditional exports alone in the year 2020 (Hinson and Sorensen, 2006). Therefore, Paliwala (2003) also noted that e-b/c transported small businesses from national to global level. The impact of e-b/c appears in global developments, internationalisation, competitiveness, new ICT based strategies and business practice (Hinson and Sorensen,

2006).

However, there are issues such as security and legal concerns, the compatibility of the new medium with the organisation and its employees, and the social impact in seeing customers through electronic interfaces rather than the traditional face-to-face interactions (Al-Qirim, 2004). E-business/e-commerce is challenging and hence requires advanced e-capabilities. It is clear that moving to, or developing e-b/c systems must be driven by commercial business considerations and not simply because “they have the technical capability”. Several organisations and authors have addressed the issue of the growth of services and their importance in the economy and how e-b/c and the Internet have the potential to increase the competitiveness and growth of small firms (DTI, 2004; Michael and Murphy, 2004; Tetteh and Burn, 2001). e-Business W@tch (2005) implies that if SMEs do not evolve in e-business, their businesses will be seriously disadvantaged five years from now.

#### **2.4 Overview E-Business/E-Commerce Initiatives, Uptake and Progress in the UK**

e-Business W@tch (2005) acknowledges that “electronic commerce is already developing dynamically in internet business trading” and that “it is important for SMEs not to be left behind in this process.” The 2005 Action Plan (e-Business W@tch 2005, p.7) promotes a “dynamic e-business environment”, which is based on the identified goal “to promote take-up of e-business with the aim of increasing the competitiveness of European enterprises and raising productivity and growth through investment in information and communication technologies, human resources (notably e-skills) and new business models”.

The UK was one of the first countries in the world to liberalise telecommunications (Department of Health, 2000). The government has ambitions to make UK SMEs a leader within the G8 group of countries (Canada, France, Germany, Japan, Italy, Russia, UK and USA) where technology is concerned (Pavic et al., 2007). Therefore the government spent more than £67 million on initiatives and programmes between 2001 to 2003 intended to create a business environment within the UK that is the most favorable in the world for electronic trading (Pavic et al., 2007), and the European Union policy also focuses on promoting ICT adoption (e-Business W@tch, 2006/07). Many specialised organisations and workshops throughout UK have been established to help SMEs evolve e-b/c in order to achieve the European Union initiatives. Many regional and national programmes are running to help SMEs use Internet platforms. Organisations involved include UK-Online for business, Trade Partners UK, TrustUK, Scottish Enterprise, ECIC (E Commerce Innovation Centre), all the Development Agencies, Local Shops Online, Business Match etc.

UK SMEs are able to compete with large companies in the same market place if they have fully integrated e-business systems (Stone, 2003). This implies that SMEs have more potential to achieve better business performance by evolving and developing e-business.

Promoting of e-b/c to UK SMEs is a firm target, an important strategy and an essential step for SMEs to be successful in the new economy. In September 2000 the government launched the UK Online for Business initiative with the aim of developing the UK as a world leader in e-business (Simpson and Docherty, 2004). According to government statistics the service has helped more than 160,000 businesses, answered 38,000 helpline calls, attracted 225,000 unique users to its website and through the "virtual advisers" network, provided on demand advice to 1,000 businesses (Hamilton, 2002). However, despite UK Online's marketing success, independent studies

suggest that it may be failing SMEs in a number of areas: a) a target of one million SMEs to be trading online by the end of 2002 was not met (DTI, 2001); b) increasing the number of SMEs actually trading online still falls almost half a million short of the predicted figure (UK Online, 2002); c) the UK's personal computer (PC) penetration rate (46%), considered a standard metric for measuring e-commerce readiness is low in comparison with most other countries who are achieving well over fifty per cent (Hamilton, 2002); and d) most government e-policies are not heightening the awareness of Internet benefits among its SMEs and do not have any effective methods in place to measure the impact of their e-policies (Hamilton, 2002).

Only five percent of UK SMEs have the full, integrated e-b/c system. According to Jeffcoate et al. (2002), most SMEs have been slow to adapt to the web and face stiff competition from online competitors with first mover advantages. eEurope Go Digital (2002) presented the data on the take-up rates of different aspects of e-b/c by SMEs in a selection of European countries as shown in the below Table 2.1:

Source: European Commission (2002), p.4

%SMEs	UK	Austria	Sweden	Italy	Neths	Norway
Using ICT	92	92	96	86	87	93
Web Access	62	83	90	71	62	73
Own Website	49	53	67	9	31	47
Making e-Commerce Purchases	32	14	31	10	23	43
Making e-Commerce Sales	16	11	11	3	22	10

**Table 2.1:** SME e-b/c adoption rate of selected countries in 2001

These take-up rates among SMEs in Europe are impressive and equate well with US take-up rates for all types of business enterprise; the UK particularly is in broad agreement with online sales information for sectors of the US economy (Buckley and Montes, 2002). Based on the no more than preliminary data presented here, the extent to which e-commerce, let alone e-business, has penetrated the SME sector to date is very much an open question. The Small Business Service (2002) reviewed the use of SME

websites and found that:

- Thirty four percent of SMEs used a website to advertise products or services
- Thirty four percent of SMEs used a website for general publicity
- Fourteen percent of SMEs used a website for customer support and liaison
- Eighteen percent of SMEs were actually trading online
- Only four percent SMEs considered themselves to be very successful in e-business

The facts yet again identified that most SMEs are in the very early stage of their e-business, with the majority of them using their website for publishing general information. Few of them fully utilise the website as an efficient marketing tool, and even less SMEs have fully integrated e-business system. Therefore, promoting e-b/c to UK SMEs is an essential but challenging target.

Globalisation and increased competition are solid reasons for companies evolving e-b/c as partly or fully integrated systems. “In the UK in recent years, one in four jobs is relevant to international business. The Government is making great efforts to help UK SMEs doing business internationally and it is now ninth in the exporting countries world list, but China have taken over the second place” said by Vicki Treadell, Director of North West, UK Trade and Investment in a seminar in Liverpool Chamber of Commerce. Central Intelligence Agency (2008) published a list of countries by exports. The message is that the capability of doing business between developed and developing countries are equal and that an international competition platform is already built.

In international markets, overseas competitors are increasing and competition will be even fiercer in the future. This will represent an

increasing threat to the British economy if the SMEs are not going to become more competitive by using tools such as e-b/c. During the period 1995-2000, half of the UK SMEs faced an increase in competition from domestic enterprises and around twenty two percent of them faced more competition from foreign enterprises (Observatory of European SMEs, 2002). Within both the national and international markets, SMEs who have not adopted e-b/c will be excluded from economic activity and will be unlikely to maintain success compared to their competitors who do.

e-Business W@tch (2004) identified that a significant share of enterprises from most sectors have started to purchase and/or supply goods electronically. e-Business W@tch (2005) identified that in the UK manufacturing sectors, supply-chain integration and the streamlining of procurement processes are common objectives for which e-business solutions are attractive. Online procurement has become a part of everyday business and belongs to the most frequently adopted e-business applications. The service sectors, especially the IT service industry, favours more use of e-business, and certainly ICT plays a significant role in the way that this product is produced, promoted and provided. A common feature in the service sectors is that online channels have become key tools for marketing, communication and interaction with customers. "Online booking, payment and customer services have been widely accepted" (e-Business w@tch, 2005, p.12). "Online trading and customer facing e-commerce activities have reached a significant level in all industries" (e-Business w@tch, 2005, p.15). Over the period 2000 to 2003, the trend from emphasising basic e-business applications (e.g. using emails, having web presence) to the adoption of Enterprise Resource Planning (ERP) systems since 2003 is a good indicator of the overall e-business maturity.

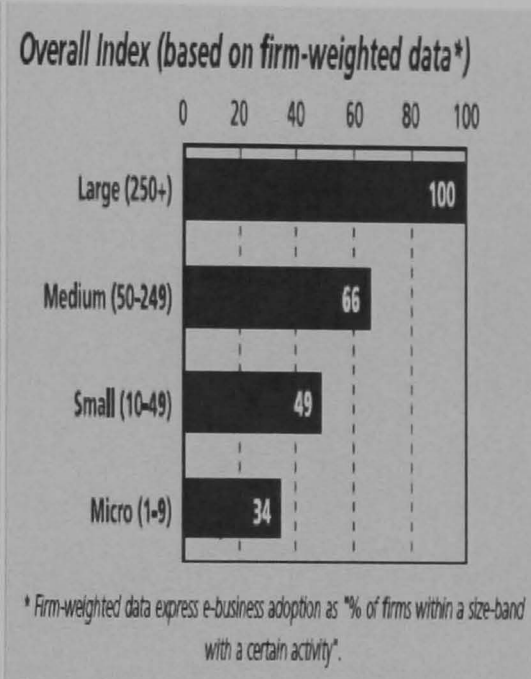
However, it seems "ICT systems of large companies obviously tend to be more powerful and sophisticated than those of small firms. The use of e-



business solutions for e-marketing and sales has increased with the company's size. This translates into more intensive and advanced electronic business practices" (e-Business W@tch, 2005, p.14). Although e-business activities are attractive for both large and small enterprises, small firms are slower adopters than large firms in all e-activities as the following table 2.2 presented by e-Business W@tch (2006/07) shows:

<b>Exhibit E-4: The e-Business Index 2006 by firm size</b>				
	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
<b>Micro</b> (0-9)	41	23	34	40
<b>Small</b> (10-49)	60	39	43	54
<b>Medium</b> (50-249)	84	56	56	67
<b>Large</b> (250+)	100	100	100	100

A = Sub-Index "ICT networks"  
 B = Sub-Index "e-Integration of internal processes"  
 C = Sub-Index "e-Procurement and supply chain integration"  
 D = Sub-Index "e-Marketing and sales"



**Table 2.2** E-business adoption within a size-band (%)

The table clearly shows e-business activities of large companies are further developed than small firms due to their powerful ICT systems for linking business processes to maximize the benefits of using e-business. Many smaller companies, by contrast, are still struggling to get digitally connected with their suppliers and customers. If they are not capable enough to deliver the performance, they risk being eliminated from the value systems that tend to be orchestrated by large firms.

However, there are opportunities for SMEs e.g. flexibility, ICT networks, potential new technologies, effective internal communication and cooperation, as well as the challenges e.g. complying with ICT requirements of large firms and lack of ICT strategy and skills (e-Business W@tch, 2005; e-Business W@tch, 2006/07).

E-business/e-commerce opportunities and solutions are evolving. This should not be used as an excuse for doing nothing, as the potential threats, in terms of survival and competition, are greater than the potential risks of changing solutions. It also means a flexible, adaptive, and pragmatic approach is the best way to proceed.

E-business adoption and development in SMEs must become better established. This must not be forced simply by the policies driven by the European Commission and UK Government but it should be determined by local communities, market demands, international competition and all users involved. SMEs must take the evolutionary tool to shape and transform their business ready for the new economic war in the worldwide platform.

## **2.5 Benefits of E-Business/E-Commerce in SMEs**

“All entrepreneurial business can benefit greatly from focusing on customer service and cost control”, said Steven Hamm, managing partner for PriceWaterHouseCoopers Middle Market Advisory Service. “Each factor is importance on its own, and both combine synergistically in our Internet economy”, he added (PriceWaterHouseCoopers, 2000b).

Daniel and Wilson (2002) state six distinct streams of benefits from e-b/c adoption which are realised by SMEs throughout every step of the business process. The major benefits are the external ones, especially in the market place. Chaffey (2002) also evaluated the impact of e-business uptake, identifying both tangible and intangible benefits. These are shown in Table 2.3 below:

Tangible benefits	Intangible benefits
<p>1. Increased sales from new sales leads giving rise to increased revenue from:</p> <ul style="list-style-type: none"> <li>- new customers, new markets</li> <li>- existing customers (repeat-selling)</li> <li>- existing customers (cross-selling)</li> </ul> <p>2. Marketing cost reductions</p> <ul style="list-style-type: none"> <li>- reduced time in customer service</li> <li>- online sales</li> <li>- reduced printing and distribution costs of marketing communications</li> </ul> <p>3. Supply-chain cost reductions</p> <ul style="list-style-type: none"> <li>- reduced levels of inventory</li> <li>- increased competition from suppliers</li> <li>- shorter cycle time on ordering</li> </ul> <p>4. Administrative cost reductions from more efficient routine business process such as recruitment, invoice payment and holiday authorisation.</p>	<ol style="list-style-type: none"> <li>1. Corporate image communication</li> <li>2. Enhance brand</li> <li>3. More rapid, more responsive marketing communications including PR</li> <li>4. Faster product development lifecycle enabling faster response to market needs</li> <li>5. Improved customer service</li> <li>6. Learning for the future</li> <li>7. Meeting customer expectations to have a web site</li> <li>8. Identify new partners, support existing partners better</li> <li>9. Better management of marketing information and customer information</li> <li>10. Feedback from customers on products</li> </ol>

**Table 2.3:** Benefits of e-business uptake

As can be seen, there are many tangible and intangible benefits for SMEs adopting e-business. The main ones appear to be:

- Intensive communication (both internal and external)
- Increased profitability
- New business opportunities
- Improved competitiveness
- Improved efficiency

- Simplified business process
- Time saved and reduced costs
- Improved internal knowledge sharing

In addition, by developing Internet based competencies, the company can bypass traditional business barriers such as the physical distance between markets and improve interaction between members of a network (Fillis et al., 2003). Having reviewed the literature on the benefits of e-business adoption by SMEs, a model was developed (known as the “6 Cs”) as a means of explaining the benefits to our case study SMEs:

- Creation                      New and diversified business opportunities
- Competitiveness          Increase efficiency and effectiveness
- Communication          Internal and external
- Collaboration              Customers, suppliers, partners and support organisations
- Control                      Operations and business development
- Cost                          Effective and efficient use of resources

Using e-business achieves real time communication via multi-channels for all the involved parties. It brings increased control of the business processes and activities. It also creates better relationships and networks with customers, suppliers and partners. Other key benefits are increased customer satisfaction, service quality, new opportunities, sales channels, markets and customers. At its heart is the creation and sharing of knowledge for added competitiveness and collaboration.

Take an example of US businesses that are involved in e-business. The CEOs see e-business as a way to tap into increased revenue through exposure to a greater number of prospective targeted-buyers. Benefits important to the US companies (%) in e-business are as follows:

- Greater revenue by access to more new buyers in US.....49%
- Better able to target prospects.....44%
- Greater revenue through sales to end-users.....42%
- Lower cost of customer service.....38%
- Lower cost of marketing.....38%
- Increased profit or margins.....36%
- Better able to cross-sell to customers.....35%

Source: PriceWaterHouseCoopers (2000a)

PriceWaterHouseCoopers (2000a) “Trendsetter Barometer” interviewed and surveyed CEOs of 441 companies, which range in size from approximately \$1 million to \$50 million in revenue/sales. The results identified that e-business has been a success for the seventy four percent of America’s fastest growing companies that have already embraced it. On average, they are generating twenty two percent of their revenues from e-business. Normally companies in service sectors generate more revenue from e-business compared with firms in other sectors and the manufacturing sector in particular. Seventy three percent of the US companies expect better marketing and business planning as a result of e-business implementation.

## **2.6 Barriers to E-Business/E-Commerce in SMEs**

Development of appropriate skills, investment in staff training and poor knowledge of the Internet process were identified as central barriers to e-business implementation and growth (Fillis et al., 2003). e-Business W@TCH (2004) states that having a website is no longer a good indicator of e-business activity. Simple and static sites do not constitute an active marketing tool that is vital for the business.

Establishing a powerful network should create a value chain with suppliers, customers, partners and even competitors internally and externally. Without it, business development and collaboration can be impeded. The real challenge is to integrate sales and procurement processes (including partners) electronically. It is difficult to find a balance between confidentiality and sharing knowledge and information, which is essential for successful networking (Observatory of European SMEs, 2002).

In 2002, twenty six percent of UK SMEs still did not have access to the Internet and only some thirty percent are using some electronic system for the business process (Observatory of European SMEs, 2002). Small and micro size companies in particular, cannot see the immediate return on e-business investment. Here, the adoption of e-business is likely to depend on the owner's attitude. However, a lack of in-company ICT skilled labour is the main obstacle to SMEs progressing to e-b/c systems (Observatory of European SMEs, 2002; Jeffcoate et al., 2002). Therefore, the whole process of transforming into e-b/c and maintenance of the system was viewed as being critical and risky.

Problems in recruitment, training, out-sourcing, keeping in-company expertise and knowledge sharing are listed as the main skills shortage challenges within companies. Development of appropriate skills, investment in staff training and poor knowledge of the Internet start-up process were also identified as central barriers to e-business implementation and growth (Fillis et al., 2004).

Typically, smaller firms suffer from a range of resource limitations that can impact severely on business strategy development. They also suffer from perceptual and physical barriers to growth not necessarily experienced by their larger counterparts (Stokes, 2000; O'Gorman, 2000). It is well documented that one of most limited resources is lack of financial resources

(Poon and Swatman, 1999). Seventy percent of SMEs expressed concerns about the high technology costs and security problems such as fraud and hacking and gave them as reasons not to adopt e-business (Chaffey, 2002).

A summary of the literature on critical issues of e-business in SMEs is as follows:

- Lack of e-business awareness in general
- Managerial attitude to ICT and business changes
- Slow e-business adoption process
- Lack of e-business capabilities especially in ICT internally
- Unidentified e-business process and its operation
- Lack of network development (internal and external)
- Lack of strategies and planning
- Lack of relevant skills, knowledge and support
- ICT and other technical difficulties
- Lack of confidentiality and security
- Resource limitations e.g. technology cost and limited budget

## **2.7 Success Factors of E-Business/E-Commerce in SMEs**

A critical success factor relevant to e-b/c activity found in all firms was commitment (Taylor and Murphy, 2003). This commitment usually came from a sound business strategy which was developed into an e-b/c and ICT strategy with clear objectives and timescales.

In the UK, SMEs consider that customer service and quality are the major success factors, along with price and location are also important too (Observatory of European SMEs, 2002).

Fillis et al. (2004) suggest that the successful adoption of e-b/c can be

achieved by developing a set of e-b/c competencies (addressed in detail below) relating to factors such as innovation, finance, productivity, human resource management and quality. Weiber and Kollman (1998) identified a number of success factors in the market place, including increased levels of quality and service, reduced costs, freeing up of time to carry out other tasks as well as flexible approaches to doing e-business or e-commerce.

SMEs can achieve global competitiveness without increasing their size, but rather by building on their virtual or soft assets in order to expand. These virtual assets include information skills, digital resources and competencies for managing inter-firm relations and collaborative engagements with other firms (Tetteh and Burn, 2001).

Collaboration is increasingly an important success factor for SMEs. The strategy for e-b/c is the most important success factor through every stage of e-b/c development and in every step of the value chain as Feindt et al (2001, p.55) claimed:

“...e-commerce is more about strategy than about technology”

Stone (2003) identified critical success measures in e-b/c around the enhancement of customer management including value proposition, trusted brand, multi-channel customer management, market competition, website quality and culture/language/geography. The choice of business model that enables the firm effectively to manage its market interactions is a critical success factor. This represents a dynamic profile of the business in terms of its vision and goals, electronic market orientation, and relations with other market players (Tetteh and Burn, 2001). E-business/e-commerce design and a wide range of ICT factors including integration of backend information systems, communication infrastructure and security controls were also identified as critical to e-b/c success (Bandyo-padhyay, 2002; Kalakota and Robinson, 2001).



Using the work of Jeffcoate et al. (2002), the e-b/c success factors into three stages of development were categorised as follows:

**Stage 1** Start-up: commitment, content, price sensitivity and convenience will be taken into account; interaction with customers become important

**Stage 2** Growth and establishment: collaboration, partnership and improved e-b/c process will be taken into account; the e-business capabilities are important at this stage

**Stage 3** Integration: needed to ensure the business can support high volume e-commerce activity.

In summary, the success factors are as follows:

- commitment and clear vision and strategies of e-b/c project
- e-b/c infrastructure especially the ICT infrastructure
- intense ICT knowledge and skills
- action priority
- functionality of website
- enhanced customer relationship management
- effective communication
- Integration and collaboration

## **2.8 E-Business/E-Commerce Models and Integration**

Weill and Vitale (2001) define the e-business model as “a description of the roles and relationships among a firm’s consumers, customers, allies, and suppliers that identifies the major flows of product, information, and money, and the major benefits to participants.” Such a broad definition poses problems in researching e-business models. Recognising this, Weill and Vitale (2001) de-construct e-business into eight “atomic e-business models”.

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They are: direct to customer; full service provider, intermediary; shared infrastructure, value net integrator, virtual community, and whole-of-enterprise/government. Firms may develop one or a combination of these models to pursue their business strategies. There will also be variants of each e-business model, depending upon the factors outlined by the authors (Currie, 2004).

Hauge et al. (2002) proposed a competence model with six dimensions of competence as shown in figure 2.1, which determine the success of e-b/c success.

**Figure 2.1** The conceptual model of e-business success (Hauge et al., 2002)

“MIT 90 framework” is the earliest e-business model, which later developed into more sophisticated e-business models (Morton, 1991). Afuah’s and Tucci’s (2001) internet business models and strategies provide a general framework for traditional organisations and new internet start-ups. According to Timmers (1999) e-business models can be identified in e-Shops, e-Procurement, e-Mail, e-Auctions, e-Mall, e-Markets and virtual communities. The literature is broadly divided into generic and specific contributions on business models, with Timmers (1999) and Weill and Vitale (2001) providing taxonomies of business models, and others looking at

specific outcomes or activities from e-business models from e-markets (Bakos, 1998); value creation (Amit and Zott, 2001); profitability (Ross et al., 2001); B2B e-commerce and group buying behaviour on the Internet (Kauffman and Wang 2001). A list of literature in Table 2.4 follows:

<b>e-Business models and authors</b>	<b>Brief description and core concept</b>
MIT90 Framework: Morton (1991)	It focuses on five forces and their interactions when re-designing any business process.
The emerging role of e-markets Bakos (1998)	It is built on buying and selling at an e-marketplace.
Business models for e-commerce: Timmers (1999)	It creates the business processes and every step of value chain creation.
Value creation in e-business: Amit & Zott (2000)	It consists of eight atomic e-business models based on value creation for companies to pursue their business strategies.
Migrating to profitable e-commerce business models: Ross et al. (2001)	It focuses on increasing revenue and reducing costs through innovation and value creation for the firm and its customers, suppliers and partners.
Eight 'atomic' e-business models: Weill & Vitale (2001)	They focus on creating a value chain for a firm and to build relationship and linkage between its customers, suppliers and partners in order to benefit all participants.
Why business models matter: Magretta (2001)	It emphasises creating competitive advantages in order to pursue opportunities in the new markets and potential profits.
Group-buying business models in Internet based selling: Kauffman & Wang(2001)	They are group-buying models (to encourage many small orders in order to increase the bargaining power so as to obtain a lower price).
Afuah's and Tucci's Internet business models: Afuah and Tucci (2001)	It is a comprehensive taxonomy e-business model in a systematic fashion that encompasses many elements and dimensions but it emphasises revenue generation.
Application service provider business model: Currie (2004)	It is about e-business applications and services and the integration between them.

**Table 2.4** A list of literature on e-business models

The table 2.4 shows a variety of e-business and few e-commerce models. Most of these models come from the dot com boom period (2000-2001), which is often known as the time of Internet “Boom and Bust”. Those are e-b/c “conceptual factor models” which can be classified into three different clusters as Pavic et al. (2007) identified:

1. supply-chain management-based models
2. operations based models
3. strategic models

There are many different e-b/c models existing to help SMEs in business, although there have been few successful examples (Currie, 2004). This has led to criticism of the popularity of the business model concept. Porter (2001) also criticises most e-business models, referring to them as a loose conception of how a company does business and generates revenue rather than creating value evaluated independently of industry structure. The one-size-fits-all approach is likely to produce a vague description of what constitutes a business model, particularly as e-business models (as the literature demonstrates) vary considerably (Currie, 2004). Pavic et al. (2007) also claim that none of the existing e-business models appear to give a complete picture of what is actually needed to create a competitive advantage in SMEs using e-business.

Taking these criticisms into consideration, it is essential to delineate e-b/c models into taxonomies (Weill and Vitale, 2001) or value-creating activities (Amit and Zott, 2001) and build competitive advantage (Pavic et al., 2007) in SMEs using e-business. This suggests that a new e-business model is needed which supports the goals of customer focus, the internet technology as a core competence, organisational readiness, lower cost and greater efficiency.

However, despite an innovative new e-business model for SMEs, stage/step models are widely and commonly used to increase companies' awareness and further e-b/c development, which were believed to be strategic models by the author. Different stage/step models were identified in the literature as follows below.

The well accepted model of Venkatraman (1994) suggests that there are five distinct levels of business transformation enabled by traditional IT systems. Localised exploitation level and internal integration level are the first two levels that are purely within the organisation (evolutionary levels). Business process design level and business network redesign level to business scope redefinition level are the higher levels with systems outside the organisation (revolutionary levels). The five levels of transformation are each based on an increasing level of integration between information systems.

A model proposed by Poon and Swatman (1999) suggest the following hierarchy. At the lowest level, firms develop inter-organisational e-commerce or Internet service with no integration with their existing systems, such as e-mail communication with customers or suppliers or the development of information-based websites. At the next level firms undertake a limited degree of integration with their existing internal systems, and only at the highest level is full integration with internal systems achieved.

Poons and Swatman (1999) do not state that the levels in their model are sequential steps through which firms are expected to pass. However, they suggest that firms are likely to pursue further integration when they perceive benefits arising from their extensive use of e-commerce, implying a staged approach. A staged approach to integration is consistent with the observation of authors such as Frank (1988), Dosi (1988) and Reid and Smith (2000), who observe small firms as organisations, which obtain experience and knowledge in a sequential steps or stages. The success in a

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lower level of step/stage forms solid foundation and useful experience for firms to move on to the next stage of development.

Previous research by O'Connor and O'Keefe (1997) and Timmers (1999) describes business models of e-commerce. The first authors characterised the models by the level of transaction and the level of information content. Rao and Metts (2003) propose that e-commerce development takes place in four stages in the following sequential model presented in figure 2.2:

1. presence
2. portals
3. transactions integration
4. enterprise integration

**Figure 2.2** Stages of e-commerce development and their characteristics  
(Rao and Metts, 2003)

The six stage model of Nolan (1979) refers to the development and use of information systems within an organisation from initiation with simple data



processing through to a mature adoption of Business Information System (BIS) with controlled, integrated systems. It is instructive to analyse the extent to which an organisation has implemented the technological infrastructure and support structure to achieve e-business when assessing the current use of ICT within a company. Quelch and Klein (1996) developed a five stage model referring to the development of sell side e-commerce as follows:

1. Image and product information
2. Information collection
3. Customer support and service
4. Internal support and service
5. Transaction

Similar stage models have been developed for e-business by Hackbarth and Kettinger (2000) and Willcocks and Sauer (2000). In these, sell side e-commerce perspective of Quelch and Klein (1996) occupies the early stages, but with greater organisational transformation and involvement of the upstream supply chain at later stages. The same model can be applied to buy side e-commerce (DTI, 2000) with different applications. The models show that companies start off using e-mail to communicate internally and with suppliers (step 1) before moving to offer product information and availability checking (step 2); online ordering (step 3); online payment (step 4); online progress tracking (step 5) and finally, when the e-business is achieved, all stages are integrated.

The DTI adoption ladder (DTI, 2001; Lynn and Matlay, 2002; Clegg et al., 2005; Beynon-Davies, 2007), is a model that describes the logical evolution of e-b/c involving different stages of development. Each stage being better in some sense than the previous stage, and can be useful in providing a roadmap for improvement to companies (Rao and Metts, 2003) as shown in table 2.5.

Level*	Key Characteristic	Main activities and intentions
1	E-mail	Create efficient internal and external communications.
2	Website	Establish a place in the worldwide market and a window on worldwide suppliers.
3	E-commerce	Build capabilities for ordering and paying online, reducing transaction costs and maximising accessibility and speed.
4	E-business	Integrate the supply chain so that manufacture and delivery become seamless; minimise waste at every stage of this chain.
5	Transformed organisation	Offer open systems of information for customers, suppliers and partners, together with new business models based on inter-working between organisations and individuals.

• *The extent of organisational change and degree of business benefit increase as the level increases*

Source: Based on a Cisco-led Information Age Partnership study for the UK Department of Trade and Industry

**Table 2.5** DTI e-b/c adoption ladder

It yet again indicates that the level of integration depends on the e-b/c applications through a wide range of e-activities for the business transformation and with the more complex application, a higher integration level is required.

Integration with existing systems is seen as an important aspect of e-commerce effectiveness (Keeling et al., 2000; Melymuka, 2000; Haapaniemi et al., 2000; Von Hoffman, 2001). Grimshaw et al. (2000) identify that companies that have achieved such integration gain greater benefits than those that have not done so. Keeling et al. (2000) also cite the importance of integration with “legacy systems”. The latest strategic e-business model proposed by Pavic et al. (2007) was based on three elements: 1) competitive advantage 2) value system and 3) four stages of integration.

From the above exploration, it is clear that step/stage model is commonly accepted in terms of e-b/c adoption and development and it certainly can be used to classify SMEs’ current e-b/c status in order to a) increase the e-b/c

awareness; b) provide a possible vision of ideal future state and the gap between current situation and c) motivate them to create competitive strategies working towards the goal(s).

Step/stage models are helpful in reviewing how advanced a company is in its use of information and communications technology (ICT) to support its processes. They have traditionally been popular in the analysis of the current application(s) of e-business usage within an organisation. Different aspects in terms of service available, e-b/c applications, organisational scope, transformation and strategy are involved in each stage of the e-b/c development. Therefore, it is necessary to assess SMEs business activities and competencies, then classify them into different stages of their e-b/c development in order to measure their current position in e-b/c and to identify the possible future position.

## **2.9 E-Business/E-Commerce Strategies in SMEs**

Typically, smaller firms suffer from a range of resource limitations that can impact severely on business strategy development. They also suffer from perceptual and physical barriers to growth not necessarily experienced by their larger counterparts (Stokes, 2000; O’Gorman, 2000). Therefore, appropriate e-b/c strategies are needed as a key to their success. Such strategies should be able to help companies view current business performance, identify new opportunities and adopt or develop the e-b/c by utilising the limited resource.

Tetteh and Burn (2001) suggest that an effective e-business strategy would include the following aspects:

- Define an appropriate online business model based on the company’s vision and strategic goals in going online

- Develop components of the infrastructure that add value to the business chain
- Use of infrastructure to develop virtual values of process, products and image - e.g. through customer interaction with website content including product information, use of graphics for retention and encouragement to re-visit, cultivate value for virtual products.
- Cultivate information skills and virtual culture in customers – e.g. through website tutorials and the development of virtual communities (e.g. newsgroups, chat rooms, forums)

Deise et al. (2000) present a novel approach based on work conducted for PriceWaterHouseCoopers to developing e-business strategy. They suggest that the focus of e-business strategy will vary according to the evolutionary stage of e-business. Initially the focus will involve the enhancement of the selling channels (sell side e-commerce); this then tends to be followed by value-chain integration (buy side e-commerce). The strategy indicates that increasing revenue should be the main priority followed by the implementation of a system to create a value network with integration as the ultimate goal.

The integration that requires processes to be re-engineered cannot be achieved immediately (Chaffy, 2002). Identified priorities of objectives can help in communicating the e-business vision to staff and also when collocating resources to achieve the strategy such as 'getting the right mix of bricks and clicks' (Gulati and Garino, 2000), which focus on sell side e-commerce as the priority. This is shown in Figure 2.3 as follows on the next page:

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**Figure 2.3 'Bricks and Clicks' (Gulati and Garino, 2000)**

A similar figure was produced by De Kare-Silver (2000) who suggests that strategic e-commerce alternatives for companies should be selected according to the percentage of the target market using the channel and the commitment of the company. If the objective is to achieve an online revenue contribution of more than seventy percent then this will require fundamental change for the company to transform to a 'bricks and clicks' or 'clicks only' company. The functionality of the e-business application represents the level of e-activity (any business activity involves electronic means e.g. online trading, web-marketing, online purchasing etc.) in the specific business area. The 'clicks only' company achieves the highest level of e-activity and in the system itself can be operated separately. The system might not necessarily be integrated with the rest of systems in other business areas but it is ready to be integrated when needed.

Venkatraman (2000) suggests a five-stage e-business strategy process:

1. strategic vision (consideration of e-business models and how to achieve business objectives)
2. operations (production, sourcing, logistics, marketing and human

- resource and other business areas)
3. e-business capability (internal or external)
  4. operational infrastructure (e-business applications through functionality and personalisation and ensuring privacy)
  5. skills and in-house expertise.

Marketing is one of the most important business areas. According to the five major components of e-business identified by Strauss and Frost (2001), the first three e-business components have obvious marketing implications. Albert and Sanders (2003) stated that web-marketing is a concept and process of adapting the relevant and current technologies to the philosophy of marketing and its management. Focused attention on e-commerce, business intelligence, customer relationship management, supply chain management and enterprise resource planning provide a framework for effective adaptation. Although the electronic environment experiences rapid changes, the reliance on proven marketing models in these areas ensures continuity of the marketing process both online and off-line.

Chaston (2000) also presents a marketing-oriented approach to 'selecting e-strategies and constructing an e-plan (e-business design)'. Current e-b/c position and the issues should be reviewed and analysed in each stage; specified strategies can be applied in each stage of e-business development to fulfill each objective.

Because of increased opportunity of the Internet and the popularity of shopping online, the evolution from direct marketing into interactive online marketing has begun. Hardaker and Graham (2001) claim that the Internet has built a further dimension into interaction and with it the marketing monologue which prevails in most direct marketing situation is being replaced by a marketing dialogue, mass or segment marketing being substituted by customised online marketing. The most promising distance

marketing method today is undoubtedly on the Internet.

Although the e-business marketing opportunity is obvious, eighty percent of the online traffic go to less than one percent of the sites available (Lake, 2000). This low percentage results from poorly designed sites that were unclear about online marketing strategies. Therefore, it became imperative to examine Internet technologies and the ways to successfully integrate them into the firm's marketing efforts.

Albert and Sanders (2003) state that customer relationship management (CRM) is critical to any firm's success with long-term relationships that avoid customer replacement costs for the firm. In leveraging the technologies of online visitors and customers, it is defined as long-term, mutually beneficial arrangements in which the buyer and seller focus on value enhancement through the creation of more satisfying exchanges (Sheth and Sisodia, 2001). In practice, it helps companies to collect consumers' information, identify customers' demand, analyse the buying behaviour and reply to their requests speedily.

CRM represents the front end of a business and its interactions with customers which are visible to the customer. SCM (Supply Chain Management: the inefficiency leads to customer dissatisfaction) and ERP (Enterprise Resource Planning: affects a firm's pricing strategy), are back-end orientated and typically invisible to the customer. CRM, SCM and ERP usually indicate the high level of e-business involvement, Albert and Sanders (2003) emphasise that they might not affect the business performance immediately at the front end but they would affect the business process and internal efficiency significantly.

Picardi (2000) recommends that a sophisticated website is the success factor to execute the e-strategies for sell side e-commerce, in particular for



online trading. PriceWaterHouseCoopers (1998) states that "Trendsetter" CEOs claim the website as a major or important contributor to their own business growth. Currently, ninety six percent of America's fastest growing companies have at least one website. Although their web sites are used in a number of different ways, "all of them realise that an effective web strategy can help to differentiate themselves and break away from the pack," says Ms. Knapp (PriceWaterHouseCoopers 1998). "Information gleaned from dialogue or hits on their own websites, from competitors' websites and from other electronic resources can be analysed and used strategically to position these companies for future growth. Managing the knowledge gleaned from these areas is an essential component of their success."

The UK Business Link suggests that using information technology to achieve best practice for better communication can be strategically competitive. Information technology includes internet, broadband, wireless networking and mobile technology.

Bringing together the idea of these pioneering authors on e-business strategies, we can note that there is no one simple strategy that fits all e-business scenarios. However, it does appear there are some common elements of e-business strategy as follows:

**Strategic vision:** assess current business situation and identify future objectives.

**Business priority:** have priorities of e-b/c objectives, applications and activities which according to business needs.

**Website Utilisation:** not only need a web presence but need to upgrade functionalities of the website in order to support a wide range of e-b/c activities.

**E-business marketing:** apply web marketing strategies and promote the e-business both online and offline.

**Developing e-b/c applications:** develop online trading, online purchasing, ERP (Enterprise Resource Planning), CRM (Customer Relationship Management), SCM (Supply Chain Management) and etc for system integration.

**Using ICT and new technologies:** using a wide range of Information Computer Technology and other new technologies to establish and develop a supportive ICT infrastructure, which can achieve designed e-b/c applications.

**Customer Orientation:** engage customers with the business, quick response to their needs, provide personalised service and develop virtual communities for improving the relationship.

## **2.10 E-Business/E-Commerce Best Practice**

E-b/c certainly has many benefits to offer SMEs, but in fact the overall slow adoption, low level of e-activities and high failure rate is significant, especially in low-tech firms. Many barriers of e-b/c adoption and development were identified by different authors, but there are no easy solutions to address the entire problem(s).

Business Link (2007a) identifies 'best practice' as "a means of finding and using best ways to achieve the business objectives." It involves keeping up-to-date with the ways that successful businesses operate in the particular

sector and measuring the ways of working against those used by the market leaders.

Business Link (2007a) also suggests that best practice can help the business to:

- become more competitive
- increase sales and develop new markets
- reduce costs and become more efficient
- improve the skills of the workforce
- use technology more effectively
- reduce waste and improve quality
- respond more quickly to innovations in the sector

Therefore, it is necessary to look at the 'best practice' both theoretically and practically to increase the possibility of success and also to demonstrate what should be done for e-b/c success in detail. Furthermore, 'e-b/c good practice' can be promoted, adopted and adapted according to the specific needs in SMEs.

Common e-b/c best practices from leading firms identified by Business Link (2007a), Barnes and Hunt (2001), Kirchmer (2004), Henry (2004), Beynon-Davies (2004), Bandyo-padhyay (2002) and Awad (2002) are:

- have clear e-b/c goals and vision of what to do next
- have priorities of e-b/c activities based on business needs
- response to customers' needs quickly through the e- b/c system
- share business activities online with its trading partners collaboratively
- survey employees and trading partners to evaluate e-b/c impact on them
- have a budget on every e-b/c project

- constantly review information technology strategy
- empower people through information sharing electronically
- use online training for staff development
- define and deliver security/privacy policies to all parties involved
- control different levels of authority to access the company's data
- provide a secure, private and reliable system for all users
- be fully aware of e-b/c relevant regulations and laws
- can work remotely
- be fully aware of the benefits that e-b/c brings to its business

### **2.11 Benchmarking and Self-assessment**

Business Link (2007b) states that benchmarking allows a firm to compare its business with other successful companies to highlight areas where the business could improve. Benchmarking is a useful management tool that managers/owners can utilise to make their businesses more competitive. It refers to the process of comparing the performance with similar organisations in key areas. By doing this, firms can:

- gain an objective picture of the business' strengths and weaknesses
- highlight changes which could make the business more successful
- spot opportunities for growth

Benchmarking involves comparisons with other businesses so firms can better understand their own current position. Therefore, they can pinpoint issues they face and develop appropriate strategies for a more successful future. Cox and Thompson (1998) recognise that benchmarking can help firms catch up with competitors, so they support benchmarking where it is

applied appropriately, and particularly when firms focus on business activities that are critical to their success.

Camp's (1989) definition of benchmarking is "the search for industry best practices that lead to superior performance." O'Dell (1994) cites that the American Productivity and Quality Centre (APQC) defined benchmarking as "the process of identifying, understanding, and adapting outstanding practices and processes from organisations anywhere in the world to help your organisation improve its performance". Spendolini (1992) defined benchmarking as "a continuous, systematic process for evaluating the products, services and work processes of organisations that are recognised as representing best practices for the purposes of organisational improvement". The author particularly favours Zairi's (1992) claim that benchmarking is about raising awareness and recognising problems and opportunities, while utilising benchmarking to optimise operations through finding and implementing better practices. Benchmarking, especially when used in association with total quality management and continuous quality improvement, is thought to have its place in today's business organisation. Benchmarking is a multi-faceted technique that can be utilised to identify operational and strategic gaps, and to search for best practices that would eliminate such gaps (Yasin, 2002).

Each of these definitions appears to emphasise different things and if we combine them all together they illustrate that benchmarking is a systematic way of achieving continuous improvement. The author believes Zairi's (1992) fundamental theory should be looked at to see how benchmarking may be deployed to improve e-b/c practice in SMEs.

McGaughey (2002) states that there are in essence three types of benchmarking: internal, external and best practice. Internal benchmarking involves establishing best practice within a division or company that

performs particularly well in some activities or process, and using this to establish benchmarks. The internal benchmarking is likely to result in greater internal efficiency or effectiveness, but not necessarily significant improvement in competitiveness (McGaughey, 2002). External benchmarking examines best practice in other organisations, be they direct competitors or organisations in similar or unrelated industries. External benchmarking can be conducted among partners in different industries but under common ownership, or among partners in different industry sectors but sharing similar processes and among competitors (Codling, 1996). Diverse companies often utilise the same or similar processes in a wide range of business areas.

The third type of benchmarking is the best practice benchmarking (Codling, 1996). Best practice benchmarking is ideally viewed as an extension of external benchmarking that focuses on emulating the best in the world. It involves identifying the undisputed best at performing the process or processes believed critical to business success. Codling (1996) suggests that the challenge of this approach is not just finding the best, but rather defining what best means in terms of critical processes being examined. Best practice benchmarking holds the greatest promise for bringing about dramatic improvements in performance, major breakthroughs, and ultimately helping an organisation to be “the best it can be”.

The author believes that each type of benchmarking has its own strengths and weaknesses. Innovative benchmarking for SMEs should utilise the strengths from the different types of benchmarking.

Numerous benchmarking tools exist that are aimed at evaluating many aspects of a business. Some of these tools are based on the business excellence model, which is the basis for annual awards by the European Foundation for Quality Management (EFQM, 1999) and a self-assessment

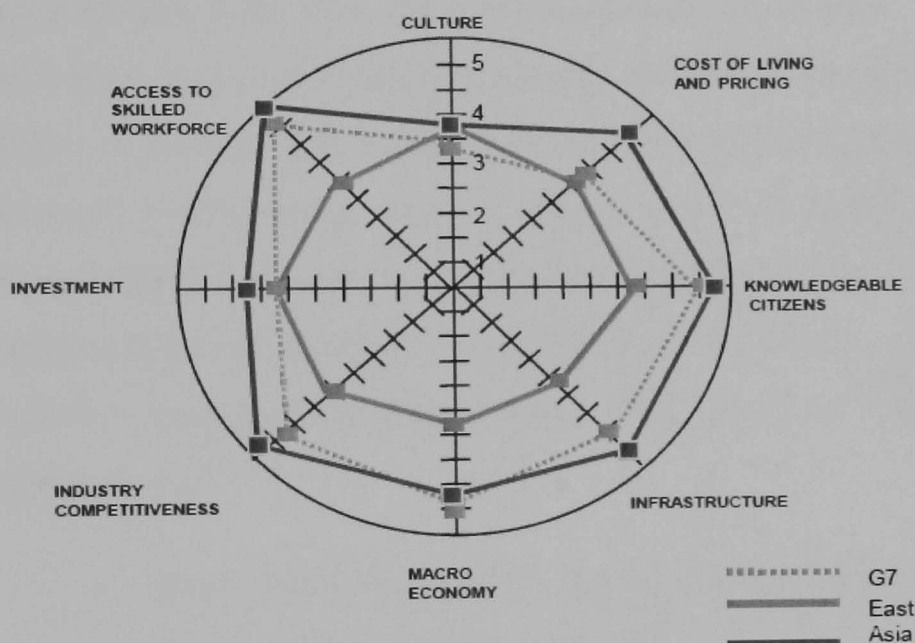
version is available (EFQM, 2002). Other benchmarking tools are based on the 'business excellence model' (Baldrige, 2002), including the DTI's UK Benchmarking Index (DTI, 2000b) and the Australian Quality Council's self-diagnostic tool (AQC, 2002). Some other benchmarking services in the UK are based on the 'CBI's PROBE tool', including versions for small firms called 'Microscope' and 'PILOT' (WLTC, 1997; Prabhu and Yarrow, 1998). These are based on a 'world class manufacturing model' that links business practices to operational and business performance (Hanson et al., 1996; Voss et al., 1998).

Current benchmarking tools cover a wide range of topics. However, these tools give little attention to IT and e-business despite the concerns of governments regarding small firm competitiveness (Cragg, 2002). This indicated a research opportunity, key focus being the consideration of the enabling role for IT and the rapid growth in e-business.

Self-assessment tools as a form of benchmarking are commonly used. Gadd (1995) cites that self-assessment has been defined by the European Foundation as a comprehensive, systematic and regular review of an organisations' activities and results in a reference against a model of business excellence. The self-assessment process allows the organisation to clearly discern its strengths and areas in which improvements can be made, and culminates in planned improvement actions which are then monitored for progress. Gadd (1995) also states that there have been many potential benefits gained from the use of self-assessment.

Gadd's (1995) business self-assessment demonstrates nine elements of business performance. Each element is further divided into sub-criteria, which builds up a comprehensive picture of what the company has done and how it is doing. The measurement is based on the degree of excellence of the results and the scope of the results.

Bui's (2003) framework for measuring national e-readiness, which (a) identifies the factors that contribute to increased e-readiness; (b) scores e-readiness across each of these factors and (c) provides opportunity to develop a composite e-readiness indicator by incorporating these factors. Eight success factors and their 52 measures are used for calculating e-readiness, with an individual score for each measure on a 5 point scale as shown in figure 2.4.



**Figure 2.4** Benchmarking e-readiness using a 5-point scale

Barclay and Porter's (2005) supply chain assessment tool was developed based on best practice in the format of 66 'Statement of Need' (SON) across the 10 main areas of core competence requirements of suppliers. Each measure has a range of scores from one to six and to assist in the self-assessment, indicative measures reflecting possible levels of capability are given for each 'SON'.

Consulting firms like PriceWaterHouseCoopers and Oracle provide an assessment tool/framework for improving e-b/c performance.



PriceWaterHouseCoopers assess firms' e-b/c performance from 10 different dimensions with a three point score scoring system. Oracle's assessment tool helps to identify opportunities for businesses improvement and assesses firms' e-b/c from 8 dimensions. Each dimension is based on the e-business strategies or applications, which are assessed and identified based on e-b/c critical success factors.

Various self-assessment tools for improving business performance were explored but only few are for e-business remedies. The self-assessment tools from large consulting firms are more complicated and less relevant to SMEs. However, the author believes Bui's (2003) framework for measuring national e-readiness and Barclay and Porter's (2005) supply chain assessment tool can possibly be combined and modified to a tailored assessment tool particularly for SMEs in e-business. The common elements identified through the exploration, which can be used for this innovative approach are:

- dimensions/categories need to be identified (based on key factors or main areas of the subject)
- each dimension/category is divided to sub directions in different levels (that are criteria or statements or best practice which are in continuous improvement but achievable)
- firms are assessed against the highest level in each dimension/category
- systematic (use a scoring system)

## **2.12 Summary and Conclusions**

The literature review provides necessary opinions/trends upon a wide range of important facts and factors for the research project as well as leading the research direction of SMEs growth and business success through e-b/c. The highlights can be summarised as follows:

### **Inevitability of e-business/e-commerce adoption and development**

E-business/e-commerce offers a wide range of benefits and promising opportunities to SMEs. The Internet promotes new ways of working, both intra-organisationally and inter-organisationally for SMEs; these two ways of working offer major potential benefits for growth and diversification. E-business especially is a new way of doing business in SMEs, it is not only an evolution of successful business systems but also a useful tool to help SMEs eliminate geographical and time restrictions for doing business and help to explore possibilities for business growth. Many tangible and intangible benefits from e-b/c adoption are realised by SMEs throughout every step of the business process. It enables a more integrated level of collaboration than ever before, bringing added strength and functionalities throughout the whole value chain in order to deliver products or services and complex projects into an increasingly competitive marketplace. The key benefits of e-b/c are improved profitability, improved communication, increased competitiveness and efficiency, cost savings, greater visibility, ability to develop new markets, partnerships and greater levels of information retrieval.

### **Reality of current e-b/c state in SMEs**

Despite the advantages of e-b/c adoption and development, the factors affecting successful uptake or otherwise of e-b/c and the generic drivers

behind the degree of success ought to yield valuable insights. Online-trading (buying and selling products/services with electronic transaction) has had a relatively poor uptake by UK SMEs, with of lack of ICT competencies and appropriate knowledge and skills being the key barriers. The literature also discussed a variety of internal and external barriers preventing SMEs' e-b/c adoption and development. Factors including lack of e-b/c awareness, vision, strategies, in-company expertise and a combination of technical and decision-making, security fears and limited resources were also highlighted. Those significant barriers prevented e-b/c adoption and development in most SMEs. As a result, they are in the very early stage of the e-b/c involvement or development. A fully integrated e-b/c rarely exists in SMEs. Using a website for publishing general information about the products/services and the company is common, but utilising any e-technology in order to execute e-b/c applications for business purpose is infrequent.

### **SMEs and support**

Given that the SME sector is considered the powerhouse of tomorrow's economies, it is alarming that how low the level of e-b/c activities and how slow and random the development is in the U.K. Much more government effort is being applied to correct this, but it is suggested that much of this is unfocussed and overlooks the particular characteristics and difficulties of the SME sector. If the pathway to successful e-b/c adoption and development could be made prescriptive, a huge benefit for SMEs would be created. Clearly general ICT and business support are needed to uplift the success of e-b/c for SMEs, which cannot be done without the government's and all relevant parties' effort.

**E-Business/E-Commerce integration and strategies**

The literature suggests that the company-wide impact of e-b/c must be managed as an integrated change process (people, processes, information management and technology) and it is considered essential that this change process is aligned with, or even drives the strategic direction of the business. System integration is recognised as an ultimate solution for e-b/c success. The author argues that although system integration might be easily identified in large firms, it is not necessarily a practical solution for all, especially in small firms. The overall e-b/c development is still at an early stage in most SMEs; they might not be ready to take on the challenges. Alternative practical strategies are needed using a step-by-step approach. Advantages gained are derived from using e-b/c successfully as an extension of business strategy rather than being technology driven. E-business is much more than the purchase and implementation of computer applications. There is a significant gap between reality and the ideal situation in e-b/c development. Firms must be able to have a clear vision and awareness of e-b/c. They need to be able to identify priorities based on business needs and they also need to improve ICT competences before taking action, otherwise, the e-b/c development will be likely to fail.

**E-Business/E-Commerce critical success factors**

Despite the external support of e-b/c, great effort should be made within the SMEs themselves. It is important for a firm to recognise which critical success factors influence and impact on their e-b/c adoption or development, and which will help firms to make better decisions and to take appropriate actions. Therefore within a wide range of success factors, some of them may help the firm to consider their capability of adopting or developing e-b/c e.g. intense ICT knowledge skills, ICT infrastructure, functionality of website etc. Some of the factors are general e-b/c strategies e.g. good customer

service, effective communication, action priority, commitment, e-b/c vision/goals etc.

### **E-Business/E-Commerce implementation models for SMEs**

Throughout the study and exploration, the author also found that there were two significant models that can be used as the foundation of further research:

- (1) 'Stage/Step models' being used to demonstrate the levels of e-business integration (from low level of e-b/c activities towards fully integrated e-b/c system).
- (2) 'Conceptual factor models' being used to understand firms' behaviour and critical success factors effect on e-b/c development for strategic decision making.

### **Self-assessment tool/framework for SMEs in e-b/c**

A self-assessment tool as a form of benchmarking was identified as being useful to improve business performance as well as increasing e-b/c awareness. Therefore, it is appropriate to be used in this research project. Consulting firms such as PriceWaterHouseCoopers and Oracle, which provided e-business self-assessments for firms in general, used tools that looked at the e-business development from more complex dimensions based on the aim of system integration that might only useful to large firms. There is no specific e-b/c self-assessment tool for SMEs. The lack of a self-assessment tool(s) for SMEs can be both a barrier and an opportunity of the research. However, a similar format and scoring system from existing tools can be adapted and used.

The outcomes of the literature formed the direction of initial research in the following areas:

- Continuously identify e-b/c practical benefits and barriers in SMEs
- Understanding SMEs' characteristics and needs for e-b/c.
- Exploring an overall level of e-b/c adoption and development in SMEs by using stage model.
- Exploring the benefits of benchmarking and self-assessment tools.

## CHAPTER 3: METHODOLOGY

### 3.1 Introduction

This chapter describes the research theory, the development of the research methodologies and samples of companies chosen at each stage of the research. It provides a rationale for the choice of research methods and the approach to their execution. Details of the justification, and use of research methods and the choice of these methodologies arose for a number reasons, the details of which are discussed individually in chapters (2, 4, 5 and 6).

According to research needs, the process of our research programme can be divided into seven key stages and two phases which are demonstrated in the following "Conceptual Research Methodology Model":

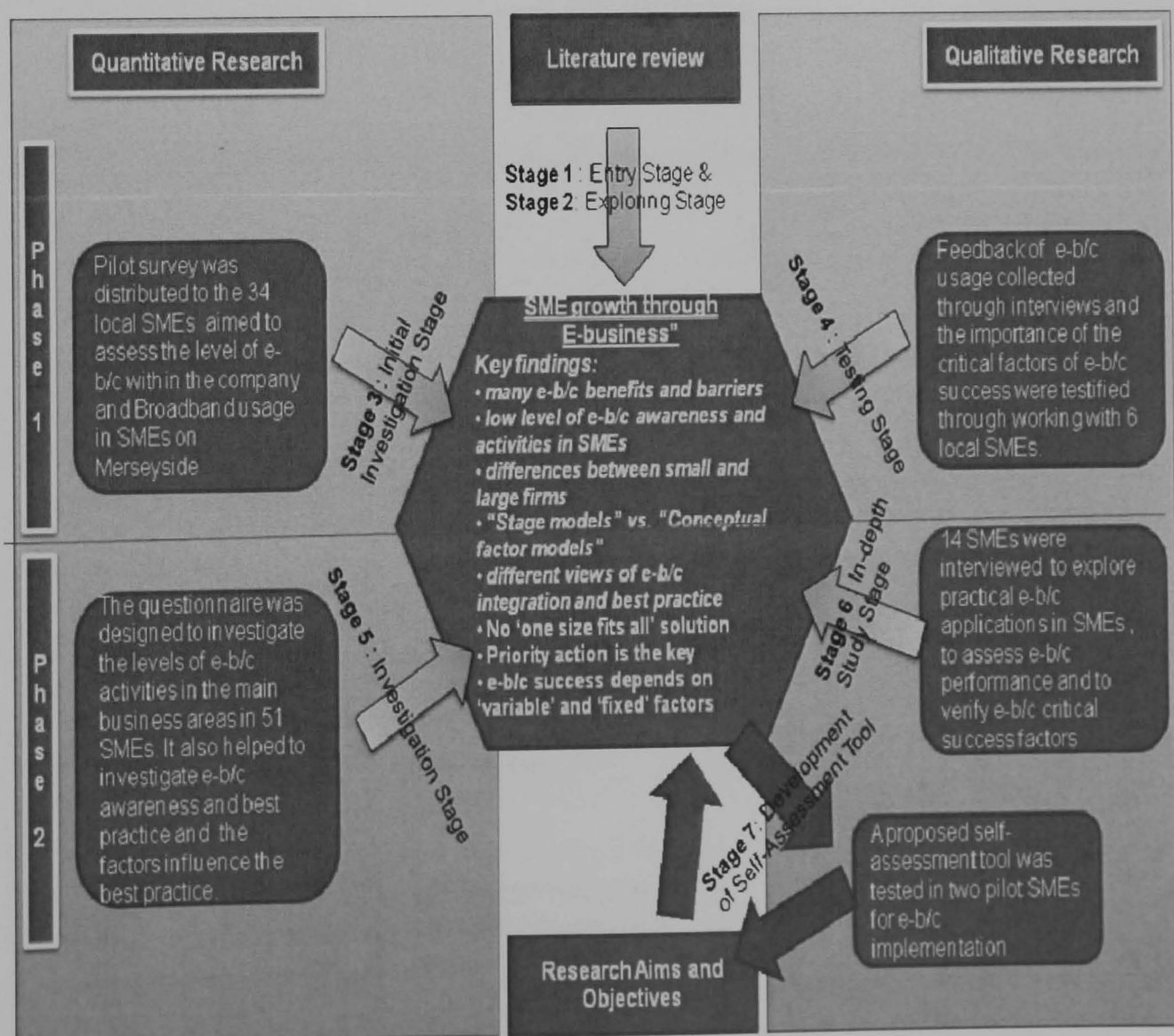


Figure 3.1: Conceptual Research Methodology Model

An outline diagram showing how the research methodologies (literature review, interviews and visits, empirical work, case study, pilot survey and questionnaire) progressed in the each research stage and outputs is depicted in figure 3.2 and the details of research process and methods will be discussed in section 3.3.

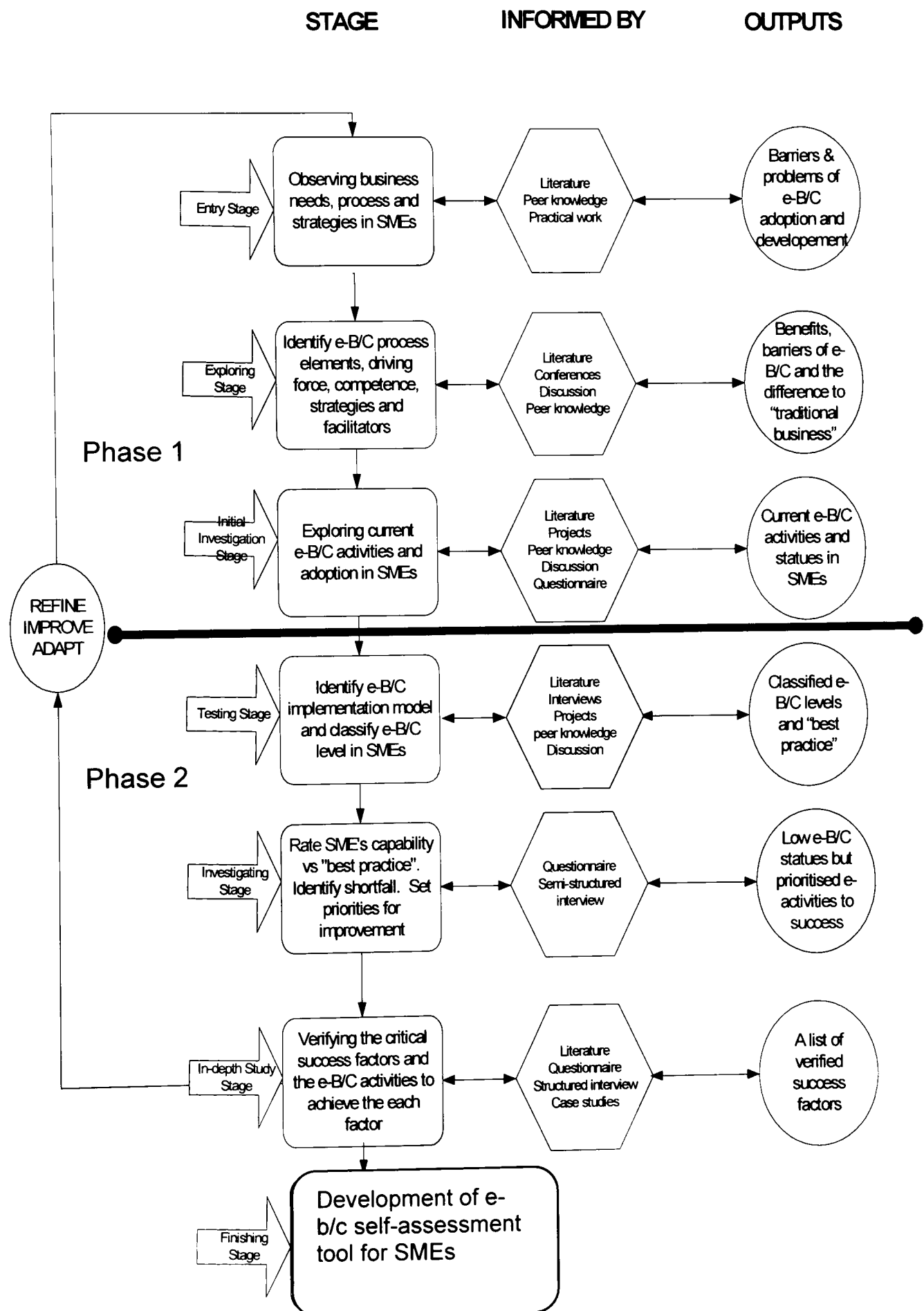


Figure 3.2: Research process and methods



### 3.2 Philosophical Approach to Methodology

This chapter discusses the research process and the steps taken to develop an e-business assessment tool. Each research method has its particular strengths and weaknesses as Denscombe (2003) states “different methods can be used to collect data on the same thing, each can look at the thing from a different angle and the possibility of employing more than one method stems from the fact that the various methods contain their own set of assumptions about the nature of the social world and the kind of data that can be produced to increase knowledge about the world.”

This research uses a combination of both deductive and inductive processes. Polit and Hungler (1995) have defined these types of logical reasoning: ‘Inductive reasoning is the process of developing generalisations from specific observations’, and ‘deductive reasoning is the process of developing specific predictions from general principles’. Deductivism is linked to empiricism, it can be seen as being concerned with rationality and testing theories through hypotheses, a positivist view. Deductive tools, particularly questionnaires were expected to play an important role in the research in order to provide objective data. Inductivism therefore is the reverse of deductivism in that it seeks to construct explanation and theories about observations from an empirical world (Polit and Hungler, 1995). The models utilised within inductive reasoning processes rely on stimulus, experience, response, interpretation, meaning and action. The qualitative data gathered from a study of quantifiable performance measures such as interviews and observation. The knowledge contributed into the research project from peer colleagues and qualified experts enhanced the researcher’s ability to carry out the project and to formalise conclusions.

Based on the nature of the research, the use of theory is directed by the emphasis on both quantitative and qualitative approaches in the mixed

methods research is the use of a theoretical lens or perspective to guide the study. Green and Caracelli (1997) mentioned the use of a “transformative design” as a distinct form of mixed methods research. This design gave primacy to value-based, action-oriented research such as in participatory action research and empowerment approaches.

Articles from books and journals relating to e-business/e-commerce (e-b/c) success factors, good practice, strategies, models, benefits, barriers, motivations and other perceptions were used for surveys. The outcomes from the surveys formed the further research in interviews and case studies. This established comprehensive and up to date knowledge on each topic helping the researcher to explore and identify the hypothesis through the six stages research process.

### **3.3 Mixed Methods Approach to Research**

#### **Quantitative Technique**

Quantitative approaches will:

- focus on a small number of specific concepts
- begin with preconceptions of how hunches are interrelated
- use structured procedures and formal instruments
- collect information under conditions of control
- emphasise objectivity in analysis
- analyse through use of statistical procedures

(Polit and Hungler, 1995)

Quantitative techniques relate to statistical complexity, which interpret information through analysing different types of data. They are typical statistical techniques that are reasonably easy and quick to use, almost a mechanical approach to analysis. The results from the analysis underlie assumptions that indicate patterns will provide some guidance to the research subject. However, “the probability or frequency of an event

occurring, however well established, is not an explanation of why it occurs” (Curran J & Blackburn R, 2001). This weakness for establishing causalities is why quantitative analysis alone is unsuitable for this research.

### **Qualitative Technique**

Polit and Hungler (1995) also described the underlying principles of a qualitative approach that generally:

- Attempts to understand the entirety of a phenomenon rather than focus on specific concepts.
- Has few preconceived hunches, stresses the importance of people’s interpretation of events and circumstances rather than the researcher’s interpretation.
- Collects information without formal structured instruments.
- Does not attempt to control the context of the research but, rather, attempts to capture it, in its entirety.
- Attempts to capitalise on the subjective as a means for understanding and interpreting human experiences.
- Analyses narrative information in an organised, but intuitive fashion.

*(Polit and Hungler, 1995 p16)*

“Qualitative research is essential to address questions of what, how (process) and why, while quantitative research is appropriate to answer questions of who, where and when” (Baker, 1992). Carr-Hill (1997) states the most persistent criticisms of qualitative research as follows:

- Researchers are subjective and data are biased
- Data collection is uncontrolled and cases have been selected non randomly
- Generalisations are not possible

*(Carr- Hill, 1997 p186)*

These two techniques tend to use human judgement and experience to collect information. Qualitative techniques relate to scenario complexity, which interpret information through analysing non-mathematical data. They are typical exploring techniques that are complex, expensive and time-consuming. They also require appropriate skills to deal with and personal bias may overrule logical solutions. The results from the analysis provide solid evidence to support the conclusion, and may approve or generate new theories to the research subject. However, they can not interpret the patterns. They are also not easy to analyse in any of the statistical forms and certainly make it difficult to present the results.

Recognising that each research method has its limitations, therefore, either quantitative or qualitative techniques used alone in this type of business and management research might impact the accuracy of the research outcomes or conclusions. For social subjects particularly the business study, use of both combined quantities and qualitative techniques are the best approaches. The concept of mixing different methods probably originated in 1959 (Creswell, 2003) and a means for seeking convergence across qualitative and quantitative methods were populated (Jick, 1979). The research focuses on collecting and analysing both quantitative and qualitative data in a single study to expand an understanding from one method to another, to converge or confirm findings from different data sources. The results from one method can help develop or inform the other method (Greene et al., 1989). Alternatively, one method can be nested within another method to provide insight into different levels or units of analysis (Tashakkori and Teddie, 1998).

The qualitative and quantitative approaches were both used through each stage of the research process, which will be discussed in detail in the following section.

### **3.4 Research Process and Methods**

#### **3.4.1 Research Process**

Zikmund (2000) states that business research often follows a generalised pattern. The stages are as follows:

1. defining the problem
2. planning a research design
3. planning a sample
4. collecting data
5. analysing the data
6. formulating the conclusions and preparing the report

Mertens (2003) also states the following research process pattern:

- defining the problem and searching the literature
- identifying the research design
- identifying data sources and selecting participants
- identifying or constructing data collection instruments and methods
- analysing, interpreting and reporting and using results

Based on the research process from Zikmund (2000) and Mertens (2003), this research project was divided into seven stages of two phases which are demonstrated in figure 3.1 and 3.2. The first research phase was designed to explore general research questions across various aspects and the results from which formed specific research questions in depth in the second phase.

The specific strategy for data collection was used as follows based on decision choices for determining a mixed methods strategy of inquiry (Creswell et al., 2003).

In the whole research process, data was collected sequentially. In the first phase (Initial Exploration), qualitative data was first gathered to explore participants' views followed by collecting quantitative data. In terms of using data and analysis, the priority was equally on quantitative

and qualitative data because the theory of both inductive and deductive framework was used for the study. In the second phase (Practical Research), the data was collected from quantitative data followed by qualitative data. A questionnaire was designed to obtain statistical, quantitative data first obtained based on the qualitative data from the first phase, and then developed into a framework so that theory, research questions and hypotheses could be tested and developed in the second phase.

Each stage in the research process is explained as follows:

**Stage 1: Entering:** problem identification and problem context

This stage was predetermined by the research grant and the previous work conducted by the SME Development Centre of Liverpool John Moores University. At this stage, it aimed to look at enterprise development, traditional business needs, process and strategies. Critical success factors for SMEs were identified through literature, peer knowledge and practical work. The research project is leading by following questions which were identified through the peer knowledge based on the previous work and the research objectives:

- Why is e-b/c successful in some areas or some SMEs but not in others?
- What types of implementation models are suitable for SMEs?
- What phases of implementation does a SME go through during its “journey”?

An initial literature review was carried out at this stage, to determine the context for the research and other key players in the field of SME development. It also aimed to collect a wide range of information that relate to e-b/c and particularly SMEs in e-b/c.

**Stage 2: Exploring:** observing and exploring e-b/c in a wide context.

Collecting a wide range of information that related to e-b/c and SMEs in e-b/c was a starting point for the research in order to better understand

the research problems. Its main aim was to explore key issues in SMEs who are transforming from traditional business to e-business at various different stages. It also aimed to identify e-b/c process elements, models, driving force, competences, success factors, barriers, strategies, best practice and facilitators that relevant to e-b/c. Its outputs were based on the literature and the initial visits to six collaborating companies.

Both theoretical and practical views helped to understand the difference between conventional business and e-b/c. The key outputs were a list of aspects that SMEs engaged in e-b/c, especially the benefits and barriers to adopting and developing e-b/c. These aspects include business needs, ICT capabilities, skills shortage, finance, resources and support. It verified the value and the direction of the research.

A literature review was carried out continuously to explore the characteristics and other relevant aspects/elements of e-b/c adoption and development in SMEs that guided the further research.

However, it brings up a broad range of issues and aspects relating to the research topic that leads up to re-focusing on areas such as:

- Use of e-b/c by SMEs
- Strategic drivers and benefits for moving to and/or developing e-b/c
- Critical factors for success/failure
- Best practice requirements – benchmarking

**Stage 3: Initial investigation:** exploring current e-b/c activities and adoption in SMEs

The initial investigation was carried out to obtain knowledge on current e-b/c adoption in Merseyside SMEs. A pilot survey was distributed to the local SMEs, followed by informal interviews/visits based on the following research questions:

- What's the best way to classify the SME sector?
- What motivated SMEs to adopt e-b/c?
- Is e-b/c beneficial to SMEs? What is preventing the success?
- What is the overall current ICT capability in SMEs?
- How do we assess current e-b/c activities in SMEs?
- Is there any correlation between firms' characteristics e.g. size, sectors and current e-b/c status?
- What use will the results be?

The output from the initial investigation was an overview of e-b/c current status and activities. It generated ideas and issues that impacted on the adoption and development, and raised the question that e-b/c integration might not be the ultimate solution in reality for SMEs. It also indicated the reasons and the critical factors for preventing e-b/c success. This was the first attempt to gather primary data and focused on exploring a practitioner's view of e-b/c adoption and development to understand and verify the research problems. The details were discussed in Chapter 4.

**Stage 4: Testing:** e-b/c implementation models and levels of e-b/c involvement

This stage aimed to test the importance of the critical factors that could influence the e-b/c adoption. It also aimed to test the feasibility of the popular e-b/c stage model as identified in the literature reviews and levels of e-b/c activities in SMEs. The testing was carried out on a small scale through interviews with four small local collaborating firms. This helped to re-identify the research problems, shaped the emphasis of the further research and indicated the appropriate content for further surveys.

**Stage 5: Investigation:** investigating e-b/c best practice and critical success factors



At the investigating stage, examination of SMEs' capability compared with best practice is critical. It aimed to identify weaknesses and needs of businesses and set priorities for improvement by using e-b/c to establish good practice in the key business areas by using e-b/c.

A questionnaire was distributed to 100 UK SMEs to identify the priority of business needs, e-b/c applications/activities and its levels. It also identified the importance and the reality of the e-b/c good practice.

The objectives of the questionnaire at this stage were as follows:

- To collect SME characteristics  
(size, sales, sector, supply chain, position, business model, business process and e-b/c activities)
- To investigate drivers/reasons of e-b/c in different types of SME
- To identify a wide range of success e-b/c factors
- To explore relationship/correlation between success factors and e-b/c good practice
- To identify current status of SME e-b/c activity and its overall level
- To identify business priorities
- To assess the awareness and the reality of e-b/c good practice
- To develop a framework for semi-structured interview

The analysis of quantitative data from the questionnaire also delivered useful results, which helped to draw a range of hypotheses, which indicated the key influencing factors determining the success for e-b/c in SMEs. Discussion of the questionnaire method, analysis and results were given in Chapter 5.

**Stage 6: In-depth Study:** exploring practical e-b/c applications in SMEs and verifying e-b/c critical success factors

At this stage, the focus of the research was to study SMEs' e-b/c activities, implementation and strategy. It aimed to identify the critical

success factors, which significantly influence e-b/c best practice and success based on the understanding of firms' success or failure experiences and stories in e-b/c.

It also aimed to gather information and evidence for designing an e-b/c assessment framework. Therefore, semi-structured interviews were conducted to:

- explore the gap between current practice and good practice
- identify the critical success factors that have significant impact on the e-b/c success in SMEs
- identify influential e-activities in the key business areas
- identify “best practice” of e-b/c in SMEs
- explore e-b/c strategies in SMEs
- outline a draft e-b/c self-assessment framework

To determine the effectiveness of the outcomes, a series of mini case studies were put together transferred from semi-structured interviews. The case studies gathered data on firms in the different stages of their e-b/c development to determine performance gaps and hence formulate effective strategies to improve e-b/c development for the business success from eight critical success factors (see Chapter 6 and 7 for the details). The case studies also verified those factors, which can lead firms working toward better performance according to their business needs and may possibly lead to a self-assessment framework for e-b/c adoption and development.

### **Stage 7: Finishing**

Gathering all the information and results, the focus was to design an easy to apply self-assessment framework for adopting/developing e-b/c in SMEs. The judgement about how to achieve e-b/c success in SMEs was based on a combination of the knowledge from colleagues, practical work, literature, questionnaires, interviews and case studies. The result that came out of the research was a generic self-assessment framework

which allowed SMEs to be able to assess their e-b/c capabilities and also to identify the shortfalls in order to take appropriate and effective strategies/actions to improve their current business performance, and therefore achieve success (see Chapter 7 for the details).

### **3.4.2 Research Methods**

#### **a) Literature review**

The literature review in a research study accomplishes several purposes. It shares with the reader the results of other studies that are closely related to the study being reported. It relates a study to the larger ongoing dialogue in the literature about a topic, filling in gaps and extending prior studies (Cooper, 1984; Marshall and Rossman, 1999). In this research, it provided a framework for establishing the importance and key concept of the study as well as a benchmark for comparing the results of a study with other findings. Several steps were taken as Creswell (2003) suggested as follows:

Step1: Begin by identifying key words useful in locating materials.

Step2: Search materials with key words from a wide range of resources.

Step3: Read the materials that relate to the research topic.

Step4: Identify key articles that are central to the research topic.

Step5: Design literature map, a visual picture of the research literature.

Step6: Organise the literature into literature map and also draft summaries of the most relevant articles that one used effectively in the final literature review.

Step7: Assemble the literature review and structure it thematically.

#### **b) Surveys and questionnaires**

Denscombe (2003) states that surveys have emerged in recent times as one of the most popular and commonplace approaches to social research. It can view statistic results on a topic comprehensively and for relatively little time investment. Such social surveys share with their

physical counterparts some crucial characteristics and advantages as follows:

- Wide and inclusive coverage on the topic – a panoramic view.
- At a specific point in time to provide a snapshot of how things are at the specific time at which the data are collected.
- Surveys lend themselves to quantitative data.
- Survey work inevitably brings with it the idea of empirical research.
- Relatively low cost and less time consuming.

Newell (1994) suggests that postal questionnaires are generally cost-effective when compared with interviews. They can also reach larger populations quickly and offer generalisation to wider populations (Kelly and Long, 2000).

However, many articles that use the results of surveys tend to have a number of weaknesses. A statistically representative sample must be obtained and this has proven to be difficult particularly in the case of the postal questionnaire. Epstein and Alfo (1994) state the first disadvantage is that one can never be certain that the group of persons who willingly (and without any incentive) make the effort to answer our somewhat detailed questionnaire truly represent the total population of a sample. They also mention another disadvantage is a self-selected sample of respondents might not represent the same characteristics of the entire population.

Surveys are tested in the real world under circumstances that cannot be fully controlled (May, 1997). De Vaus (2002) portrays surveys as being sterile and unimaginative due to their quantitative origins. Questionnaires are also limited in terms of there being no opportunity to probe beyond the given answers. This could stem from the poor response rate synonymous with postal questionnaires or the lack of control over who actually completes the questionnaire, proposes Nachmias and Nachmias (1997).

**c) Interviews (semi-structured and informal interview)**

The interview is the main tool of the qualitative methodologist. It has a long history in the social sciences (Wolcott, 2001). Many forms of interviewing exist, each with their own role, rules and requirements. Where research involves open-ended questions, examination of attitudes or perceptions, interviews are considered by Gray (2004) to be the best approach. Although they can be time consuming, but they often explore a deeper insight of a complex situation because respondents tend to talk around the main question and offer valuable opinions that the researcher may not have considered. They can be used in conjunction with other research techniques that often approve statistical hypothesis and provide a completed picture of the research project. This research used semi-structured interviews, which not only enable the collection of qualitative data from a range of key questions within the researcher' control but also allowed interactive conversations between the researcher and the interviewees. This technique can help us "step into the mind of another person, to see and experience the world as they do themselves" (McCracken, 1988). With this aim, throughout the study, at each phase of the research, participants were interviewed. Interviewees, especially the local business owners behaved differently in their responses, which can be explained as symptomatic of their awareness and attitude towards e-b/c that is often directed towards future e-b/c adoption or development.

It is important to note that the methodological dominance of interviewing throughout the 1970's and 1980's led, in the 1990's and beyond, to a considerable rigour, which approaches the kind of quantitative demeanour that has preoccupied survey research. By way of a response, qualitative researchers have paid attention to the assumptions concerning the controlling role of the interviewer, and these have led to new directions in qualitative interviewing that emphasise the voices and feelings of the respondent, and the interviewer-respondent relationship (Ritchie, 2003). Developing that kind of understanding and the related sensitivities were uppermost in establishing relationship. Effectively, the author was able to use the tone and terminology of the academic to the

research project being appropriate in the circumstances to elicit the most meaningful responses from the dynamic business world.

Qualitative research is always conducted in natural settings (Rossman and Rallis, 2003). All the interviews were conducted in the office environment and also recorded to a laptop with Microsoft OneNote software. For each visit recorded information included; basic company information, business background, current e-b/c activities/strategies and future intention/strategies of development.

There were a number of reasons for using a face to face approach. The researcher was already conducting interviews with SMEs, a time consuming and expensive method of data collection, so it seemed appropriate to prepare the interview questions beforehand in order to make best use of the time by using a semi-structured interview. The information collected was often quite sensitive and needed the face-to-face approach because a questionnaire alone would not have provided as much insight. The semi-structured interviews also provide to SMEs the opportunity to freely explain what they considered to be the real reasons behind their company's success by involving e-b/c. A large amount of data has been gathered that offers insights into business in general, some of it relevant to the research, some not, but most of it offers insight into the workings of SMEs in the concept of e-b/c adoption and development.

#### **d) Case studies**

Case studies were considered an excellent technique for this research as they rely on direct observation, are used to understand complex social phenomena, explain causal links in real life interventions and describe the real life context in which they occurred. Remenyi et. al (1998) states that case studies contribute in important ways to our knowledge and they arise out of a need to understand and explain complex phenomena. Remenyi (1998) also states that in research the case study has two

distinct features. Firstly the case study can be used in establishing valid and reliable evidence, secondly the case study can be used as a vehicle for creating a story or narrative description of the situation being studied, in such a way that the resulting narrative represents a research finding in its own right and thus can be said to have added something of value to the body of knowledge. It is clear that the case study methodology is a way of establishing valid and reliable evidence for the research process as well as presenting findings, which result from the research.

The constraints pertaining to the questionnaire survey method despite its considerable advantage, could be removed using the case study method. Case study method primarily referred to as interview method, is recommended by Yin (1998) for the degree of detailed investigation achievable with this method. The interview method enables the researcher to visit the respondents' premises and operations, it allows the researcher to obtain a practical insight of the studied subject and even gains access to the firm's documents. Yin (1988) suggests that the interview method is able to provide answers to "why" and "how" questions, while the postal questionnaire could be a fast and cheap tool for answering "what" questions. Yin (1989) also states that a case study from a research strategy point of view may be defined as an empirical inquiry that investigates a contemporary phenomenon within its real life context, when the boundaries between phenomenon and the context are not clearly evident, and in which multiple sources of evidence are used. It is particularly valuable in answering who, why and how questions in management research. According to Bell (1993) the philosophy behind the case study is that sometimes only by looking carefully at a practical real-life instance can a full picture be obtained of the actual interaction of variables or events.

The 14 case studies featured in Chapter 6 were selected over an extended time period. A great deal of knowledge was acquired, not just by the researcher but also by colleagues from the research group. As a part of her regular duties the researcher took notes while in the

companies, spoke to employees and generally took the trouble to learn about how SMEs worked and where their strengths and weaknesses lay. Over time certain SMEs were discussed more than others and discussions with the colleagues from the research group led to more complete pictures forming about a company in e-business or commerce.

### **3.5 Research Population**

The research population used in this study consisted of companies engaged in any form of e-b/c activities in UK SMEs with the turnover between £50, 000 to £10,000,000. These were predominantly based in the Merseyside region and across different sectors include manufacturing, retail/wholesale, telecommunications, banks/insurance, hotel & restaurant and other services across the England. This was selected based on UK SIC codes.

The pilot survey was distributed to 34 SMEs in the Merseyside region in the first phase (initial exploration phase). The large scale questionnaire was carried out in 2005 where 100 companies were selected and 51 firms responded.

The main reasons for limiting the population was to ensure that the results could be compared effectively and valid conclusions drawn. The sectors were chosen for a number of reasons:

1. Companies in the sectors are likely to need e-b/c as a business tool
2. Companies in the sectors are likely to engage in e-b/c
3. The type of e-b/c activities are relatively easy to define, identify and quantify in the sectors.
4. The sectors provide a large population from which to choose an appropriate sample.



Other factors influencing the choice of the sectors as an appropriate population included the Great Merseyside Broadband project and results from initial investigation.

### **3.6 Limitations of the Methodology**

The main limitation in the research methodology stemmed from:

- **Lack of diversity in our samples**

Most of the respondents are at the beginning and developing stages of e-b/c. There are only few SMEs at a high-integrated level in terms of e-b/c success, which can provide “good practice” to be benchmarked. More successful cases could be studied, but they can rarely be identified and captured in the SMEs context, especially in non high-tech sectors.

- **Limited sample size**

In carrying out the questionnaire it would have been better to have had a larger sample size to distribute responses across the range of determining variables. Because of limited resources and firms' availability, it was difficult to collect a large number of respondents. However, the response rate was reasonable and the sample size was statistically viable. Semi-structured interviews were also conducted to accomplish the questionnaire.

- **Geographical limitation and sample representativeness**

It would be ideal if the data could be collected from different regions across the country equally, but in reality the local SMEs responded better than SMEs in other regions. It would be ideal if the same size could match SMEs' population in different selected sectors but it was not possible in practice for many reasons.

In addition, there was a concern that the bias from the researcher might influence the outcomes of the research. However, other research methodologies such as pilot survey and questionnaire can be used

effectively to validate most of the results from the case studies on a statistical level.

### **3.7 Summary**

This chapter has outlined the nature of this research as well as the possible approaches and techniques that could be used to overcome them. The two research phases and seven stages in the research process were discussed in detail. The various methodologies have been reviewed with explanations as to why they were applicable or otherwise. The techniques for collecting data and their advantages and disadvantages have also been reviewed. The overall methodology is presented along with an explanation for the use of the combined set of techniques and why it is particularly robust with regard to the circumstances in which the research was done. The data samples used are examined to determine that they are representative and the details of how the research was executed are clearly presented in table 3.1 as follows:

Stage	Purpose	Research Methods	Research Sample/Source
<b>1. Entry stage:</b> problem identification and problem context	To identify the research problem, scope, justification and context.	Literature review	Previous SME development work and online resources
<b>2. Exploring stage:</b> observing and exploring e-Business/Commerce in a wide context	To identify e-B/C processing elements, driving force, benefits, barriers, competencies, strategies and facilitators.	Literature review/ Informal interviews	100 journals, books and online resources.  Merseyside SMEs
<b>3: Initial Investigation Stage:</b> exploring current e-B/C activities and adoption in SMEs.	To collect initial data and overviews of e-B/C in SMEs, therefore to lead the research direction.	Informal interviews then followed by exploratory questionnaire	60 Merseyside SMEs
<b>4. Testing Stage:</b> testing theoretical e-B/C implementation models and exploring levels of e-B/C involvement	To verify the research direction and shape the emphasis of the research.	Informal interviews and practical work	4 UK companies (Liverpool based)
<b>5. Investigation:</b> investigating e-B/C best practice and critical success factors	To explore the e-B/C best practice and the critical success factors. Evaluate through statistical analysis which of the determinants for significant e-B/C best practice and success factors.	Questionnaire research and analysis	51 SMEs induced
<b>6. Critical Investigation Stage</b>	To verify the effectiveness of the research outcomes and to develop a methodology/scoring system for using the assessment tool.	Semi-structured interviews and converted case studies	14 firms (10 SMEs and 4 large companies)
<b>7. Finishing Stage</b>	Convert the research into a proposed self-assessment tool for companies to increase the self-awareness, to assess their e-B/C capabilities and to improve further e-b/c performance for the business success.	Peer discussions and judgements based on all research methods.	All associated resources.

**Table 3.1:** Summary of the stages of research, purpose, methods and sample organisations used

## **CHAPTER 4: INITIAL INVESTIGATION**

### **4.1 Background of Initial Investigation**

The literature review explored a wide range of rudiments related to SMEs and e-b/c, it also highlighted important facts and factors. There are many significant benefits of e-b/c as well as a variety of barriers. Therefore to explore a firm's views on the e-b/c benefits and barriers is the foundation of the initial investigation stage. It is also important to gain an overview picture of SMEs' current e-b/c status for further research based on our stage model (see details in Chapter 2.8).

The initial investigation was carried out to obtain an overview on current e-b/c adoption in Merseyside SMEs through the Greater Merseyside Broadband Project (see press release about the project in Appendix 1). The initial investigation of the research project started from the following questions:

- What is the best way to classify the SME sector?
- What motivates SMEs to adopt e-b/c?
- Is e-b/c beneficial to SMEs? What is preventing the success?
- What is the overall of current ICT capability in SMEs?
- How do we assess current e-b/c activities in SMEs?
- Is there any correlation between firms' characteristics e.g. size, sectors and current e-b/c status?
- What use will the results be?

### **4.2 The Greater Merseyside Broadband Project**

#### **4.2.1 Introduction**

The Greater Merseyside Broadband Project (GMBP) gave a grant to the Technology Management Group (TMG) between January 2005 and January 2006. The project aimed to:

- assess the current level of e-b/c and Broadband usage in SMEs in Merseyside;
- work with Sector Directorates to assess specific sector needs;
- assist at least 45 SMEs in understanding and using e-b/c and Broadband; and
- hold seminars for SMEs to promote e-b/c and Broadband usage.

The work was carried out in three main areas:

- Getting companies online that were not using the internet.
- Moving companies from simple dial up etc to Broadband.
- Helping Broadband users to better exploit the technology.

In terms of the focus of the company work, the advice provided ranged from:

- Basic information on ICT and the use of e-b/c.
- Detailed and high level technical assistance.
- Use of Broadband for sales and marketing.
- Website design and specification.

The specific output targets were as follows:

- Detailed advice and support to 45 companies
- Promotional seminars for Broadband and e-Business adoption

Broadband is basically a business tool. Whilst “being on-line all the time” is attractive, the real benefit from Broadband adoption and use is for business development and growth. This means some form of e-b/c and not just website presence. The basic Merseyside problem is that most SMEs have neither the knowledge nor expertise to adopt this way of trading.

At this stage, a pilot survey (see Appendix 2 for the final version of survey with code) and informal interviews (see Appendix 3 for interview

questions) are the key research methods. Observations were also gained through the empirical work that contributed to the research project.

The pilot survey and informal interviews were designed and conducted to identify the current state of e-b/c and broadband usage in Merseyside SMEs, it also helped to identify the support required to implement or develop those companies' e-b/c capability. The pilot survey sent to 34 companies selected from the local SME database, aimed to assess the level of e-b/c within the company and Broadband usage in SMEs on Merseyside. A wide range of information was captured including SMEs' attitudes to e-b/c, current e-b/c activities, level of integration, e-b/c future intention, supply chain involvement, ICT capabilities and investment.

The captured information was entered into Excel for data analysis, which allowed the author to focus on the interviews in order to explore the insight into e-b/c activities in Merseyside SMEs.

#### 4.2.2 Survey results

Ninety one percent of SMEs in Merseyside are small and micro firms, only nine percent of firms are medium size. (table 4.1)

No. of Employee	Percentage of employees	Turnover (in £000s)	Percentage of turnover
1-9	38%	Below 100	9%
10-49	53%	100-249	15%
50-99	6%	250-1,000	32%
100-249	3%	Over 1,000	32%

**Table 4.1** Characteristics of firms in Merseyside

The results related to a number of important areas, including:

- a) E-business/e-commerce adoption, current status and future intention
- b) Investment in ICT
- c) Companies' ICT capabilities

### **a) E-Business/E-Commerce adoption, current status and future intention**

Seventy percent of the sample companies had taken up e-b/c as a part of their business strategy but thirty percent of the companies are not willing to participate in any e-b/c activities at present.

A stage model (see Appendix 4) was used to assess SMEs' e-b/c activities in order to identify their current e-b/c status and future intention.

The companies were asked to select a stage that best described their current e-b/c activities and also to select a stage that would be ideal for them in the future. From the responses, the key results are divided into current and future e-b/c status as follows:

#### **Current e-b/c status:**

- Nine percent of companies still at level 1-“Start Stage” where no electronic activities exist.
- Thirty two percent of companies are currently only at level 2-“Entry Stage” where no website exists.
- Fifty percent of companies are currently at level 3-“Presence Stage” where email was used as their main communication tool and website was only used for publishing information.
- There were only five percent of companies at level 5 which is “e-Business” stage” and there was only two percent of companies at level 6-“Transformed Stage” where a sophisticated and fully integrated e-b/c was existed.

#### **Future Intentions:**

- All companies were willing to reach a higher stage within next 2 years.
- Twenty four percent of companies wanted to achieve the highest level (level 6 -“Transformed Stage”)
- Twenty six percent of companies wanted to achieve level 5: “e-Business” stage”
- Forty four percent of companies wanted to achieve at least level 4:

## “e-Commerce Stage”

### **b) ICT investment**

The key points are:

- On average, the pilot companies had invested around £3000 in ICT.
- None of these companies had invested over £100,000 in their ICT.
- Twenty percent of companies' ICT investments were still under £1,000 in total.

Most of these companies were willing to invest and upgrade their ICT system including website, software and hardware in order to reach the highest stage possible in the next 12 months according to our interviews.

### **c) ICT capability**

The key points are:

- Forty four percent of the pilot companies call for ICT support on an ad-hoc basis when required. Those companies normally are not involved in any advanced e-b/c activities simply because of limited ICT capability. They were categorised as inactive e-b/c participators.
- Thirty percent of companies have a reasonably good level of ICT knowledge and skills. Some e-b/c activities e.g. Internet-marketing, online-trading were normally found in those companies but the ICT support still came from external contracted companies with ICT expertise.
- Only twenty six percent of companies have in-house ICT expertise, which enabled them to deliver sophisticated e-b/c activities and have integrated systems e.g. linked CRM and integrated supply chain systems in order to deal with complex e-b/c applications.
- E-b/c was certainly not fully adopted in Merseyside SMEs, the overall level of e-b/c activities was very low and there was hardly any evidence found to support an integrated system as the only way to success.



Lack of ICT capabilities (knowledge, skills and facilities), financial support and the awareness of e-b/c were the main reasons for the inactive e-b/c involvement overall.

### **4.2.3 Interview results**

The feedback of interviews were summarised in the four following areas:

(1) The main reasons for the failure of e-b/c adoption in ranking order as follows:

- Lack of ICT skills and expertise
- Lack of e-b/c awareness and strategies
- Poor IT facility/systems, especially the ICT infrastructure and website
- Ineffective communication
- Costs and limited resources
- Don't have broadband in the area

(2) System integration

- None of the firms has a fully integrated e-b/c system
- Only few firms fully understand the benefits of having an integrated e-b/c system.
- Most of firms believe that it is not necessary to have an integrated e-b/c system at all
- Firms cannot afford the costs of having a fully integrated e-b/c system

(3) E-b/c implementing model

- Each business is a unique case therefore it is difficult to identify a generic model which fits all businesses
- "Stage model" is a useful tool that can help firms to identify their current e-b/c performance and possibilities for the future development
- Stage model does not show firms how to improve their current performance

(4) Current e-b/c activity

- E-b/c activities will be only adopted/developed based on business needs
- Most of e-b/c activities were found in marketing, sales and customer service but not linked with all business functions
- Slow adoption and development of e-b/c in most SMEs
- Cost effectiveness of e-b/c development cannot be justified

#### 4.2.4 Summary

Through the initial investigation based on the Greater Merseyside Broadband Project (Appendix 1) and observations through practical work with companies in the region, the results can be approximately summarised as follows:

- Overall the level of e-b/c integration was very low. The main reasons are: lack of e-b/c awareness, commitment, strategy, skills/knowledge, advice and support.
- E-business or commerce activities were hardly found in low-tech and less ICT focused companies. Advanced e-b/c activities e.g. CRM and ERP were only found in five percent of SMEs.
- Website was identified as one of most important factors which could influence e-b/c success. Most SMEs only use their websites for publishing information but failed to support a wide range of e-b/c activities online e.g. online trading.
- Web-marketing was identified as a critical factor to e-b/c success as well as the most popular e-b/c application in demand but it has not been properly understood and adopted in most SMEs.
- The stage model is very useful to identify a firm's overall e-business performance in terms of the level of integration but it does not advise SMEs how to improve their performances.

A wide range of issues of e-b/c adoption and development in SMEs were identified through the initial investigation summarised as a lack of:

- understanding of e-b/c as a business growth tool

- commitment
- internal ICT capability, knowledge and skills
- ability to specify in detail their e-b/c requirements,
- e-b/c strategies
- support and ICT investment
- fear of being “ripped off” by ICT consultants

Clearly the general ICT business support environment needs to be improved to increase e-b/c adoption by SMEs.

### 4.3 Critical Issues for Future Development

There are many issues that prevent companies from using and/or exploiting Broadband and its related e-b/c activities. On the evidence of this work, these may be summarised under three areas:

\* **Lack of awareness:** Many SMEs are not aware of the potential benefits that Broadband and e-b/c activities can bring.

\* **Lack of vision and commitment:** Many SMEs only use very simple Internet based applications. They do not have goals, vision and strategies of adopting and developing e-b/c. E-b/c is seen as not cost effective or needed in some SMEs.

\* **Lack of technical expertise:** This is the biggest problem. Given that the average size of a Merseyside company is only about 12-15 employees, they cannot afford to employ a technical specialist. Those that hold in-house expertise usually have it via an employee with a personal interest in ICT. Those without in-house expertise expressed great concern about using consultants because of potential, or actual, bad experiences.

The output from the initial investigation clearly indicated the overview of current e-b/c status is low (Ninety one percent of companies at or below level 3-“Presence Stage”). The initial investigation generated ideas and issues that affect the adoption, it challenged some of the theories that a fully integrated system is not the only way to success and certainly it is not popular in SMEs. This was the first attempt to gather primary data and to explore practitioners' view of e-b/c adoption thus to understand and verify the research problems.

The initial investigation allowed the author to re-focus on the research direction, which led by the following research questions:

- What are the factors that might influence e-b/c adoption and development in SMEs?
- What factors might impact on firms' e-b/c capabilities?
- Is there any correlation between SMEs characteristics/factors and e-b/c good practice?
- Is there any alternative e-b/c implementing model instead of stage model?
- How important is e-b/c good practice and what is the overall e-b/c performance?
- What is the level of e-b/c activities in each business area?

The results helped the author to re-defined the research questions. The results also informed the research direction for the next stage that a large-scale questionnaire would be needed.

## CHAPTER 5: QUESTIONNAIRE ANALYSIS and RESULTS

### 5.1 Introduction

An initial investigation (Chapter 4) on SMEs in e-business/e-commerce (e-b/c) showed benefits, barriers, drivers, success factors and a wide range of other aspects relating to SMEs in e-b/c in general. The results from a pilot survey based on initial research and stage model, showed a low level of e-b/c involvement and ICT capability. Although literature defines e-b/c success associated with full integration, current reality argues that integration is not necessarily popular and realistic in SMEs. The focus of the research changed to a wide range of success factors and e-activities. Therefore, the need for a full questionnaire became clear as it was important to re-shape the research to explore an overview of e-b/c awareness and activities in SMEs, and a range of important factors or e-activities that influence good e-b/c practice.

The questionnaire (Appendix 5.1) was led by the following research questions:

- What factors might influence e-b/c adoption and development in SMEs?
- What are the essential e-b/c capabilities or critical success factors?
- Is there any correlation between SMEs characteristics and e-b/c success?
- What are the priorities in SMEs growth by using e-b/c?
- How advanced are current e-b/c activities?
- What are the key business areas in which e-b/c system can help to improve the performances?
- Are SMEs aware of e-b/c best practice and the effects that this might have on their business performance?

It aimed to:

- Collect SME characteristics

(size/ sales/ sector/ supply chain/ position/ business model/business process and e-b/c activities)

- Investigate drivers/reasons of e-b/c in different types of SME
- Identify a wide range of e-b/c success factors
- Explore the relationship/correlation between success factors and e-b/c good practice
- Identify current status of SME e-b/c activity and its overall level
- Identify business priorities
- Assess the awareness and the reality of e-b/c good practice
- Develop a framework for semi-structured interview

This chapter explains the questionnaire preparation and conduct, and also discusses its data analysis and results. This was then subsequently used to answer the above research questions and to develop a framework for more in-depth qualitative research.

The analysis addresses distinct areas. The descriptive statistics were used to evaluate the spread of each of the variables under examination, and correlation statistics were used to discover relationships between a range of influential factors and good practice and SME characteristics. Efforts that were made to ensure reliability, accuracy and validity of the research method are also discussed. Conclusions are based on the key findings from the questionnaire. Results of the questionnaire formed a semi-structured interview to collect in-depth information and evidence.

## **5.2 Questionnaire Methodology**

The following discusses the rationale for the use of the questionnaire, its content, sample, preparation and conduct.

### **5.2.1 Rationale for use of a questionnaire**

Bailey (1978) mentioned that a questionnaire can be used to collect information about behaviours, needs, and opinions. Questionnaires can

also be used to measure client satisfaction, to gauge opinions on various issues and to add credibility to the research. Instead of using any secondary sources, the information collected from a survey is the direct response to specific question(s) that are most up to date. The advantages and disadvantages of using a questionnaire were discussed in chapter 3.4.2.

Ideally, SMEs in e-b/c should be surveyed across a wide range of sectors in order to obtain accurate information. However, this is not practical and is unrealistic for such a large population. Therefore, this questionnaire was distributed to a range of firms deemed to be suitable and likely to adopt/ use e-b/c. These were chosen from six industrial sectors i.e. Manufacturing, Hotels and Restaurants, Telecommunications, Retails/ Wholesales, Banks and Insurance companies and Other Services.

Administration of the questionnaire was carried out in a variety of ways including self-administrated postal questionnaires accompanied with face-to-face questioning. The data gathered from the questionnaire lend themselves to quantitative analysis and use of statistics, which was able to provide a road map for qualitative data collected in the next research stage.

### **5.2.2 Questionnaire content**

The questionnaire (Appendix 5.1) was designed to identify the factors and the current e-activities of e-b/c. It consisted of four parts:

#### **Part 1: Company Detail**

This section recorded contact details of the companies involved. The information was used for the company details and the contact for follow up interviews.

### Part 2: Company Information

This section generated SMEs characteristics and a wide range of factors influencing e-b/c adoption and development. Most of the data was collected as descriptive data which allowed the classification of companies into groups according to the different criteria e.g. number of employees, industrial sectors, e-b/c driving force, business goals, Internet connection, PC network, communication tools, business priority, in-house ICT expertise and mobile working ability.

### Part 3: E-b/c Activity Levels

In this section, the respondents were asked to select the closest description of their business activity in each of five following key business areas: purchasing, resource management, marketing, sales and customer service. This section aimed to identify the different integration levels of e-b/c amongst the companies. Each statement (question) in this section was provided in the ranking order from "1" (traditional business activity), to "3" (highest e-b/c level).

### Part 4: E-b/c Practices

This final section aimed to identify companies' e-b/c awareness and current practice. The respondents were asked to rate from 1 (not important or very poor) to 5 (very important and very good) for each statement of e-b/c good practice. A five points scale technique was used to collect the interval (scale) data to identify SMEs' perception, attitude and behaviour towards the e-b/c.

### 5.2.3 Sample: nature, size and response rates

The questionnaire was initially designed to target SMEs involved in e-b/c activities with SMEs across the UK. One hundred firms were selected based on the criteria through the SME Development Centre and the Liverpool Chamber of Commerce. Fifty one firms responded and agreed to participate in the research project.



#### **5.2.4 Questionnaire preparation and conduct**

The questionnaire development followed the key stages described by Czaja and Blaire (1996). They suggest that a typical survey development process should include the following stages:

- (a) design and planning
- (b) pre-testing
- (c) final design and planning
- (d) data collection
- (e) data coding, data file construction, analysis and final reporting.

##### **(a) Design and planning**

This stage aimed to define the variables under scrutiny, to prepare the questionnaire based on the literature review and initial investigation as described in Chapters 2 and 4. A postal questionnaire followed up by a telephone call was planned to encourage a better response.

A first draft questionnaire was designed for the research project based on previous broadband survey (Appendix 2), which was discussed in chapter 4.2. A short introduction (the reasons behind the project) and instructions on the questionnaire were given in a personalised cover letter. At the beginning of the questionnaire, a brief purpose of the project and the structure of the questionnaire were introduced. Then followed a section on company details, designed to capture every respondent's name, address and contact details. Importantly, the questionnaire was designed to identify useful respondents. Respondents were not required to complete the questionnaire if they were not directly involved in e-b/c at this stage. A return envelope and a personalised covering letter accompanied each questionnaire to increase participant response.

##### **(b) Pre-testing**

This is widely discussed as being vital to the success of the questionnaire instrument (Fink and Kosecoff, 1985). Therefore, the questionnaire was passed to other researchers and colleagues for constructive and valuable feedback. It was then pre-tested in ten SMEs within the Merseyside

region through the SME Development Centre for comprehension and validity. The feedback was positive but some changes were made to improve the relevance and comprehension of the questionnaire.

**(c) Final design and planning**

The questionnaire was finalised after testing with six pilot companies. Since then, no further changes were made. A confidentiality policy agreement was produced to reassure respondents that the data collated would only be used for the purpose of the research project.

**(d) Data collection**

In terms of increasing the responses of the self-administered questionnaire, the following were used as suggested by Scott (1961):

- The length of the questionnaire was made as concise as possible, the size being reduced to three pages. The instructions clearly indicated the approximate time for completing the questionnaire and the confidentiality agreement section assured privacy.
- A separate short formal covering letter introduced the purpose of the questionnaire and research.
- A return envelope was included with the questionnaire to help increase the response rate.
- The format and layout were improved following the first draft.
- The contact details were also clearly provided so that the respondent could contact the author immediately for any enquiries.

### **5.3 Analysis Techniques and Data Types**

Both parametric and non-parametric tests were used, exploiting nominal and interval data contained some of the key analysis statistics with details, techniques for the questionnaire analysis include:

**1) Descriptive statistics:** e.g. mean, mode, frequency distributions and crosstabs

**2) Parametric statistics/Significance tests:** these include Paired-samples t-test, Independent-samples t-test, One-way ANOVA test and Post Hoc tests

### 5.3.1 Introduction to the analysis techniques

This section explains why each type of statistics was selected, what type of data is to be analysed from the questionnaire and that kind of outcome expected from performing the analysis.

#### 1. Descriptive Statistics

Gravetter and Wallnau (2000) state descriptive statistics have a number of uses. These include:

- to describe the characteristics of your sample in the Method section of your report
- to check your variables for any violation of the assumptions underlying the statistical techniques that you will use to address your research questions; and
- to address specific research questions.

Descriptive statistics provide the “summary” statistics (Pallant 2005) e.g. mean, mode and frequency distributions, which were provided to describe and summarise the characteristics of the data set (Kerr et al., 2002). It is common to collect data that often represent individual participant’s scores on variables of interest.

Frequency distribution was used to obtain descriptive statistics for categorical variables (Tabachnick and Fidell, 2001), a range of nominal data were analysed from the questionnaire. The outcome from the analysis should enable the description of the proportions of each response in company information section from questions 1 to 16 (e.g. size, sector,

e-b/c motivation, business goals, current levels of e-b/c activities and a range of ICT capabilities including ICT skills). A range of nominal data was also applied (from questions 11 to 15) comparing different average levels of e-b/c activity between five main business areas.

The mean of each good practice and its awareness was employed to describe interval variables. The test provides the sum of all the observations divided by the number of observations made, which gives average mean scores of each good practice and its awareness (Kinnear and Gray, 2004). A range of interval data were applied (from questions 16 to 30) to obtain mean value of each asked question in order to compare the mean value between them.

The mode was applied to define the most frequently occurring variable in the sample. If there are two scores that occur most frequently, then the sample is said to be bimodal (Kinnear and Gray, 2004). It was used to identify which business area most was frequently involved in e-b/c activity.

The Crosstabulation was employed to form two-way and multi-way tables and to provide a variety of tests and measures of association for different categorical variables (Pallant, 2005). Firms were segmented into two groups: 1) small firms: less than 50 employees and 2) medium firms: more than 50 employees for the test, in order to identify specific characteristics of small firms and their differences from larger firms.

## **2. Parametric statistics/ Significance tests**

Descriptive statistics allow comparisons to be made between different sets of data in terms of their typical scores and how the data is distributed. The parametric tests (e.g. t-tests, analysis of variance) make assumptions about the population that the sample has been drawn from (Pallant, 2005). This often includes assumptions about the shape of the population distribution (e.g. normally distributed). Parametric statistics are much more complex, used to test hypotheses, and to make inferences about a

sample to a larger population. Independent Sample T-test, One-way ANOVA test and Post Hoc Tests were used to ascertain whether there is a statistically significant difference among a number of groups and factors given a variety of interventions or influencing variables (Kerr et al., 2002).

**a) Paired-samples t-test**

Pallant (2005) states that Paired-samples t-test (also referred to as repeated measures) is used to compare the mean scores for the same group of people on two different occasions, or under two different conditions, or when are matched pairs. The test procedures compares the means of two variables for a single group. It computes the differences between values of the two variables for each case and tests whether the average differs from 0. The test must be applied to two specific quantitative variables (interval-level or ratio-level of measurement). The output from Paired-samples t-test produces three tables 1) Paired Samples Statistics: a summary statistics table for the two experimental conditions, so the two mean scores from each paired condition can be compared; 2) Paired Samples Correlations: which provides the value of Pearson's  $r$  (Pearson  $r$  correlation is widely used in statistics to measure the degree of the relationship between the linear related variables, both variables should be normally distributed. In statistics, the value of the correlation coefficient varies between +1 and -1, then it is said to be a perfect degree of association between the two variables. As the value goes towards 0, the relationship between the two variables will be weaker) and the two-tailed significance value (if  $p < 0.05$  then the pair is significantly correlated) between the two conditions to identify either positive correlation ( $r$  value between +1 and 0) or negative correlation ( $r$  value between 0 and -1) between each paired condition; 3) Paired Samples Test: the most important of the tables which tells us whether the difference between the means of the two conditions was large enough not be a chance result (Field, 2005; Wright, 2002). The test produces two-tailed probability (Sig. value by default) to justify the significant difference between each paired condition not by chance (Field, 2005).

### **b) Independent-Samples T test**

Independent sample t-test is used in situations in which there are two experimental conditions and different groups have been used in each condition. Instead of looking at differences between pairs of scores, the test is used to compare the mean scores on some continuous variable for two different groups of subjects.

Fifteen paired variables (e-b/c good practice) from question 16 to 30 were tested for groups (users and non users) of a wide range of ICT devices and skills (questions 7,9 and 10) expecting to explore whether there is a statistically significant difference in the mean scores for the two groups on the chosen subjects. Other subjects (Q1: size, Q2: sector, and Q 8: business priority) were also chosen to test statistical significant difference between the two different groups in each subject.

### **c) One way ANOVA with Post Hoc test**

One-way ANOVA test is used when there is one independent (grouping) variable with three or more factors (Cohen, 1988). One way analysis of variance involves one independent variable, which has a number of different levels. These levels correspond to the different groups or conditions. The test is used to determine whether there are significant differences in the mean scores on the dependent variable across the factors. Once a significant F-value (The F Value or F ratio is the test statistic used to decide whether the sample means are within sampling variability of each other. F is the ratio of the Model Mean Square to the Error Mean Square. Under the null hypothesis that the model has no predictive capability--that is, that all of the population means are equal--the F statistic follows an F distribution with  $p$  numerator degrees of freedom and  $n-p-1$  denominator degrees of freedom. The null hypothesis is rejected if the F ratio is large, which proves that the means are not all equal). Only when the ANOVA found a significant effect, then a post-hot test is needed to ascertain which groups differ from each other and where these differences lie because the ANOVA test result does not show how

exactly which means are significantly different from which other ones. There are many types of post-hoc tests all based on different assumptions and for different purposes. Tukey's HSD (default by the SPSS as the most commonly used test) is a versatile, easily calculated technique that allows you to answer just about any follow up question you may have from the ANOVA. Post Hoc comparisons using the Tukey HSD test indicate which group of users are significantly different from other ones (Field, 2005).

A range of interval data (questions 16-30) and a group of nominal data (Q3: e-b/c driver, Q4: business goal, Q5: Internet connection, Q6: ICT network, Q11-15: e-b/c activity level) were conducted for One-way ANOVA test to examine whether there is a statistically significant difference between and within groups on the chosen subjects. When there were significant differences approved between the groups in different levels of e-b/c activity (Q11 to 15), then applied Post Hoc test to specifically identify which level of e-b/c activity has the statistical significant impact across 15 e-b/c good practices.

### **5.3.2 Results, analysis and discussion**

#### **1) Descriptive statistics:**

##### **(a) Small enterprises vs. medium enterprises**

Table 5.1 shows that there are many identifiable differences when small firms are compared with medium firms.

<b>Characteristics/Size</b>	<b>Appendix</b>	<b>Small Firms</b> (1-49 employees)	<b>Medium Firms</b> (50-250 employees)
<b>Total number of firms</b>		37	14
<b>e-B/C Driver:</b> customer driven trading partners	5.2	72% 8.3%	50% 21.4%
<b>Service Orientation:</b>	5.3	81%	71%
<b>Business Goals:</b> growth life style maintain current size	5.4	89.2% 5.4% 5.4%	92.9% 0% 7.1%
<b>ICT Infrastructure:</b> unlinked PCs WAN	5.5	32.4% 5.4%	7.1% 42.9%
Broadband other methods	5.6	91.9% 8.1%	100% 0%
<b>Communication Methods:</b> phone/fax email website Intranet/Extranet	5.7	86.5% 89.2% 48.6% 10.8%	64.3% 100% 21.4% 28.6%
<b>Business Priority:</b> communication collaboration marketing purchasing sales resource management customer service	5.8	67.6% 18.9% 78.4% 10.8% 59.5% 8.1% 54.1%	64.3% 14.3% 35.7% 14.3% 57.1% 0% 71.4%
<b>ICT Skills:</b> ad-hoc in-house ICT expert external contract	5.9	35.1% 43.2% 37.8%	7.1% 78.6% 35.7%
<b>Mobile Working Ability:</b> mobile phone Bluetooth PDA/laptop video conference wireless	5.10	92% 31% 71% 5% 34%	100% 36% 79% 30% 57%

**Table 5.1** Firms' characteristics: small vs. medium firms

There are some interesting and significant differences as follows:

- All firms are primarily driven by their customers into e-b/c adoption or development. In addition, trading partners are a marked influence on medium firms but not small firms.



- One third of these populations of small firms still have unlinked PCs and only 5.4% of them have Wide Area Network (WAN), compared with only 7.1% of medium firms having such poor ICT facility and nearly half of them have WAN. All medium firms use Broadband but 8.1% of small firms still use other methods e.g. ISDN and dial-up.
- The majority (78.6%) of medium firms depend on in-house ICT expertise to solve their ICT problems, but only 43.2% of small firms have an in-house ICT expert and over half of them still use ad-hoc or external contacts.
- All medium firms mainly use email communication with all parties involved in business, but this is not the case for all small firms. 28.6% of medium firms use Intranet/Extranet for their communication but only 10.8% of small firms use Intranet/Extranet.
- There are more medium firms using remote devices especially in terms of using wireless and videoconferencing for working when compared with small firms.
- Marketing is the key priority for small firms but customer service is the key priority for medium firms when they want to improve businesses through e-b/c development. There are still 8.1% of small firms interested in improving resource management but none of the medium firms shared the same interest.

There are significant identifiable differences between small firms and medium firms in terms of motivation, priority for development and e-b/c capabilities (ICT infrastructure, ICT skills and knowledge, communication method and remote working ability). Small firms are likely to lack e-b/c capabilities overall.

### **(b) Manufacturing vs. service firms**

Table 5.2 shows that there are some significant differences between manufacturing and service firms as follows:

<b>Characteristics/Size</b>	<b>Appendix</b>	<b>Manufacturing Firms</b>	<b>Service Firms</b>
<b>Total Number of Firms</b>		10	41
<b>e-B/C Driver:</b> customer driven trading partner competition future trends	5.11	90% 10% 0% 0%	60% 12.5% 7.5% 20%
<b>Business Goals:</b> growth life style maintain current size	5.12	80% 0% 20%	93% 5% 2%
<b>ICT Infrastructure:</b> linked PCs unlined PCs WAN	5.13	30% 50% 20%	65.9% 19.5% 14.6%
Broadband other methods	5.14	89% 11%	95% 5%
<b>Communication Methods:</b> phone/fax email website Intranet/Extranet	5.15	90% 90% 30% 10%	78% 92% 44% 17%
<b>Business Priority:</b> communication collaboration marketing purchasing sales resource management customer service	5.16	70% 30% 60% 20% 60% 0% 60%	66% 15% 69% 9% 59% 7% 59%
<b>ICT Skills:</b> ad-hoc in-house ICT expert external contract	5.17	50% 40% 20%	22% 56% 42%
<b>Mobile Working Ability:</b> mobile phone Bluetooth PDA/laptop video conference wireless	5.18	90% 30% 60% 10% 20%	95% 33% 77% 13% 46%

**Table 5.2** Firms' characteristics: manufacturing vs. service firms

The key findings are:

- Customers have a significant influence on manufacturing firms rather than service firms when they adopted and developed e-b/c by

customer force compared service firms. Service firms are influenced by more factors e.g. future trends, trading partner and competition compared with manufacturing companies.

- Although growth is the ultimate business goal for the majority of all firms, but there are twenty percent of manufacturing firms only want to remain at their current size.
- Half of the manufacturing firms still use unlinked PCs, but 65.9% of service firms have linked PCs which is more than double compared with manufacturing firms. In addition, more service firms have Broadband and use email, website and Intranet/Extranet to communicate with all parties involved in their businesses than manufacturing firms.
- More service firms use in-house ICT expertise and external contractors but a lot less used ad-hoc to solve ICT problems when compared with manufacturing firms.
- More service firms use remote devices especially in terms of using wireless and PDA/laptop for working rather than manufacturing firms.
- In terms of e-b/c adoption and development, communication is the key priority for manufacturing firms but it is marketing for service firms. Service firms are less interested in collaboration and purchasing than manufacturing firms but more interested in marketing and especially the resource management.

Superficially it appears from the statistics that service firms are more determined to grow, more of them have a website, have better mobile working ability, ICT infrastructure and skills than manufacturing firms. At this stage, all the assumptions made are difficult to prove. Other hidden factors i.e. numbers and relationships of customers, nature of the products might be the reasons for the difference rather than sectoral factors.

**(c) E-business/e-commerce activity levels**

The most frequent level (mode) of e-activity in each business area is shown in Table 5.3. It shows that overall e-b/c activities are still at level 1 and 2 (see details in Appendix 5.19).

		the business activities in purchasing that implies the level of e-activities in the business process	the business activities in resource management that implies the level of e-activities in the business process	the business activities in marketing that implies the level of e-activities in the business process	the business activities in sales that implies the level of e-activities in the business process	the business activities in customer service that implies the level of e-activities in the business process
N	Valid	50	51	51	50	51
	Missing	3	2	2	3	2
Mode		1	3	2	1	2

**Table 5.3** Most frequent e-b/c level in each business area

Table 5.4 shows that overall medium firms achieve a higher level of e-b/c integration than small firms in most business areas. Small service firms perform exceptionally better than manufacturing firms especially in resource management and customer service. It seems that service orientation most likely has the influence on e-b/c performance.

<b>Business Area</b>	<b>Highest Level Achieved</b>	<b>SM</b>	<b>MM</b>	<b>SS</b>	<b>MS</b>
Purchasing	Level 3: source/payment online	14%	<b>33.3%</b>	30%	10%
Resource Management	Level 4: electronic resource management system	0%	0%	<b>6.7%</b>	0%
Marketing	Level 4: online and offline marketing	14.3%	0%	26.7	<b>45.5%</b>
Sales	Level 3: order/payment online	14.3%	0%	20.7%	<b>27.3%</b>
Customer Service	Level 4: online community	0%	0%	<b>3.3%</b>	0%

**Table 5.4** Percentage of highest e-b/c level based on size and sector

**SM:** small manufacturing firms

**MM:** Medium manufacturing firms

**SS:** small service firms

**MS:** Medium service firms

In general, size has significant influence on the level of e-b/c activity that plays a major role in e-b/c success but in exceptional cases the sectoral factor might have significant impact too (Appendix 5.20).

### 3) Parametric statistics/Significance tests

#### (a) Paired-samples t-test

The test compares the means of two sets of variables (e-b/c awareness: how important each e-b/c good practice vs. e-b/c practice: how well they perform in each good practice) for same group of respondents. Two sets of paired interval data (P1 to P15) from Question 16 to 30 from the same respondents were conducted to the paired-sample t-test in order to compare the mean difference.

Table 5.5 lists a range of e-b/c good practice in the order of most important practice to the least important practice for SMEs based on the value of mean scores.

<b>e-b/c good practice (P= awareness vs. practice) (Appendix 5.21)</b>	<b><u>Awareness</u> Mean Score</b>	<b><u>Practice</u> Mean score</b>	<b><u>Mean</u> Difference</b>
P14: provide a secure & reliable system for all users	4.08	4.06	+0.02
P5: quick response to customers' needs via e-b/c	3.88	3.56	+0.32
P13: control different levels of access authority	3.80	3.70	+0.10
P3: have full awareness of e-b/c benefits	3.74	3.46	+0.28
P1: have a clear e-b/c goal and vision	3.58	3.14	+0.44
P2: have e-b/c priorities based on business needs	3.52	3.26	+0.26
P8: budget on every e-b/c project	3.48	3.30	+0.18
P15: can work remotely	3.46	3.36	+0.10
P4: have full awareness of e-b/c regulations & laws	3.39	2.92	+0.47
P12: define & deliver security/privacy policies to all	3.37	3.22	+0.15
P9: constantly review ICT strategy	3.34	3.14	+0.20
P10: sharing information electronically	3.33	3.08	+0.25
P6: collaboratively sharing business activities online	3.06	2.73	+0.33
<b>P11: use online training for staff development</b>	2.58	2.32	+0.26
<b>P7: survey employee &amp; evaluate e-b/c impact online</b>	2.52	2.12	+0.40
<b><u>Overall Mean Scores</u></b>	<b><u>3.64</u></b>	<b><u>3.15</u></b>	

**Table 5.5 Mean scores: e-b/c awareness vs. practice**

Positive mean score difference found in every paired mean scores (e-b/c awareness mean score vs. e-b/c good practice mean score), which demonstrates that firms do not execute e-b/c good practice as well as they thought. The table also highlights that surveying and evaluating e-b/c impact and training staff online are not important for SMEs.

The paired sample test also shows that there is a significant difference (sig.  $\leq 0.05$ ) between e-b/c awareness and practice in some areas including e-b/c goals and vision, awareness of e-b/c regulations and laws, quick response to customers' needs via e-b/c, sharing business activities online, sharing information electronically, use online training for staff development and survey employee and evaluate e-b/c impact online (see summarised information from Appendix 5.21 and initial test results from Appendix 5.22).

#### **(b) Independent-sample t-test**

Independent-sample t-test used to compare two sets of mean scores (e-b/c awareness: how important is each e-b/c good practice and e-b/c practice: how good are firms at each good practice) separately on two sets of fifteen continuous variables (from question 16 to 30) for two different groups (users and non-users) of each method/device in question 7, 8, 9 and 10.

The two sets of fifteen variables and two different groups (users and non-users of chosen subjects from question 7: phones and fax, email, website, Intranet/Extranet; question 9: ad-hoc, in-house ICT expertise, external support; and question 10: mobile phones, PDA/laptops, wireless devices, Bluetooth, videoconference) were selected for the test in order to explore whether there is a statistically significant difference in the mean scores of e-b/c awareness and e-b/c practice for users and none users of each chosen subject.

Part 1 of the summarised results: mean difference in e-b/c awareness (Appendix 5.23) shows there was positive mean difference (the mean score difference  $>0$ ) in awareness of each e-b/c practice between users and non-users of website, in-house ICT staff and wireless. It demonstrates

the users are more aware of e-b/c good practice. The Appendix also shows there was a negative mean difference (the mean score difference  $<0$ ) of awareness of each e-/c good practice between users and non users of ad-hoc to solve ICT problems. It demonstrates users of ICT ad-hoc are less aware of e-b/c good practice. The results of statistically significant differences between users and non users of each chosen subject were also highlighted in this Appendix.

Following the summary, the results from a set of Independent-sample t-tests were attached in Appendix 5.24, 5.25, 5.26 and 5.27 in order to illustrate the details and help to draw useful findings later.

The users of websites achieve higher mean scores of awareness in each e-b/c good practice than the non users, there is positive mean difference of awareness in each e-b/c good practice between the two groups (Appendix 5.24). It indicates users of websites are more aware of each e-b/c good practice than non-users. The Appendix also demonstrates there was statistically significant difference in the mean scores of awareness in most e-b/c good practice which proves the significant difference between the users and non-users of websites was identified.

The users of ICT ad-hoc achieve lower mean scores of awareness in each e-b/c good practice than the non users, there is negative mean difference of awareness in each e-b/c good practice between the two groups (Appendix 5.25). It indicates users of ad-hoc ICT are less aware of each e-b/c good practice than non users. The appendix also demonstrates there was statistically significant difference in the mean scores of awareness in most e-b/c good practice which proves the significant difference between the users and non users of ICT ad-hoc was identified.

The users of in-house ICT staff/experts achieve higher mean scores of awareness in e-b/c good practice than the non-users, there is positive mean difference of awareness in each e-b/c good practice between the two groups (Appendix 5.26). It indicates users of in-house ICT

staff/experts are more aware of each e-b/c good practice than non users. The Appendix also illustrates there was statistically significant difference in the mean scores of awareness in most e-b/c good practice which proves the significant difference between the two groups was identified.

The users of wireless achieve higher mean scores of awareness in e-b/c good practice than the non users, there is positive mean difference of awareness in e-b/c good practice between the two groups (Appendix 5.27). It indicates users of wireless are more aware of each e-b/c good practice than non users. The Appendix also illustrates there was statistically significant difference in the mean scores of awareness of e-b/c good practice which proves the significant difference between the two groups was identified.

Amongst all the awareness of e-b/c good practice, the significant difference in means scores of the awareness in following e-b/c good practice were repeatedly found between users and non users of website, in-house ICT staff, ICT ad-hoc and wireless:

- Have e-b/c priorities based on business needs
- Have clear e-b/c goal and vision
- Can work remotely
- Sharing information electronically
- Provide secure and reliable system to all users
- Quick response to customers' needs
- Collaboratively sharing business activities online
- Constantly review ICT strategy

Part 2 of the summarised results: mean difference in e-b/c good practice (Appendix 5.28) shows there was positive mean difference (the mean score  $>0$  which) in e-b/c good practice between users and non-users of website, in-house ICT staff and wireless. It demonstrates the users are better e-b/c performers than non- users. The appendix also shows there was negative mean difference (the mean score  $< 0$ ) of e-b/c good practice



between users and non users of ad-hoc ICT. It indicates the users of ad-hoc ICT are worse e-b/c performers than non-users. The results of statistically significant difference between users and non-users of each chosen subject were highlighted in the Appendix 5.28.

Following the summary, the results from a set of Independent-sample t-tests were attached in Appendix 5.29, 5.30, 5.31 and 5.32 in order to illustrate the details and help to draw useful findings later.

The users of website achieve higher mean scores of each e-b/c good practice than the non-users, there is positive mean difference of each e-b/c good practice between the two groups (Appendix 5.29). It indicates users of website are better performers of e-b/c than non-users. The Appendix also demonstrates there was statistically significant difference in the mean scores of most e-b/c which proves the significant difference between the two groups was identified.

The users of ICT ad-hoc achieve lower mean scores for each e-b/c good practice than the non-users, there is negative mean difference of each e-b/c good practice between the two groups (Appendix 5.30). It indicates users of ICT ad-hoc are worse performers of e-b/c than non-users. The Appendix also demonstrates there was statistically significant difference in the mean scores of most e-b/c good practice which indicates the significant difference between the two groups was identified.

The users of in-house ICT staff/expert achieve higher mean scores of each e-b/c good practice than the non-users, there is positive mean difference of each e-b/c good practice between the two groups (Appendix 5.31). It indicates users of in-house ICT staff/expert are better at each e-b/c practice than non-users. There was also statistically significant difference in the mean scores of some e-b/c good practice which proves the significant difference between the two groups was identified.

The users of wireless achieve higher mean scores in each e-b/c good practice than the non-users, there is positive mean difference of each e-b/c good practice between the two groups (Appendix 5.32). It indicates users of wireless are better at each e-b/c practice than non-users. There was also statistically significant difference in mean scores of some e-b/c good practice which proves the significant difference between the two groups was identified.

Amongst all the e-b/c good practice, the significant difference in mean scores of the following e-b/c practices were constantly found between users and non-users of website, in-house ICT staff, ICT ad-hoc and wireless:

- Remote working
- Sharing information electronically
- Providing a secure and reliable system
- Constantly reviewing ICT strategy
- Defining and delivering security/privacy policies to all
- Online staff training

The results illustrate the users of website, in-house ICT staff/experts, wireless do not only have better awareness of e-b/c good practice but are also better at executing each practice. Conversely, the users of ICT ad-hoc have less e-b/c awareness and they are also worse e-b/c performers. This implies that communication methods, ICT competence and ICT skills are the critical factors of e-b/c success.

Significant differences were identified in the mean scores of some e-b/c good practices e.g. remote working ability, e-b/c priority, e-b/c goal and vision and effective communication between users and non-users of website in-house ICT staff, ICT ad-hoc and wireless can be seen as important factors to e-b/c success.

The same t-test was used to identify statistically significant mean differences between users and non-users of website, in-house ICT staff, ICT ad-hoc and wireless in both medium and small firms separately. Therefore, answers of Question 16 to Question 30 (15 e-b/c good practice) from small and medium firms were selected to the test separately.

The part 3 summarised results: medium vs. small firms in mean differences of e-b/c good practice (Appendix 5.33) shows there was statistically significant mean differences between users and non-users of website, in-house ICT staff, ad-hoc and wireless in small firms rather than in medium firms.

Following the summary, the results from a set of Independent-sample t-tests were attached in Appendix 5.34 to 5.41 in order to illustrate the detail and to compare the differences between small and medium firms. The key findings are as follows:

There was no significant difference in mean scores of all e-b/c good practice between users and non-users of website in medium firms (Appendix 5.34). Conversely, there was a statistically significant difference in the mean scores of most e-b/c good practice between users and non-users of website in small firms (Appendix 3.35).

There was no significant difference in mean scores of all e-b/c good practice between users and non-users of ICT ad-hoc in medium firms (Appendix 5.36). Conversely, there was statistically significant difference in the mean scores of most e-b/c good practice between users and non-users of ICT ad-hoc in small firms (Appendix 5.37).

There was no statistically significant difference in the mean scores of most e-b/c good practice except (“constantly review ICT strategy” and “use online training for staff development”) between users and non-users of in-house ICT staff in medium firms (Appendix 5.38). Conversely, there was

a statistically significant difference in mean scores of six e-b/c good practice between users and non-users of in-house ICT staff in small firms (Appendix 5.39).

There was no statistically significant difference in mean scores of all e-b/c good practice between users and non-users of wireless in medium firms (Appendix 5.40). Conversely, there was a statistically significant difference in the mean scores of most e-b/c good practice between users and non-users of wireless in small firms (Appendix 5.41).

The results suggest that using website, in-house ICT staff, ICT ad-hoc and wireless have significant impact on e-b/c good practice in small firms but not in medium firms. Using in-house ICT staff has an impact on more e-b/c good practice in small firms rather than in medium firms. Maybe this evidence provided strong support for the view that there is significant difference between small and medium firms in terms of communication method, ICT competence and skills. Therefore, those subjects/factors are more critical and relevant to small firms rather than medium firms.

The same t-test was used again not only to compare the difference in the mean scores of e-b/c awareness between users and non-users of website, ICT ad-hoc and wireless and between small and medium firms. Therefore, answers of Question 16 to Question 30 (15 awareness of e-b/c good practice) from small and medium firms were selected separately to test.

The Part 4 summarised results: medium vs. small firms in mean difference of e-b/c awareness (Appendix 5.42) show there was statistically significant mean difference of users of website, ICT ad-hoc and wireless in small firms rather than in medium firms.

Following the summary, the results from a set of Independent-sample t-tests were attached in Appendix 5.43 to 5.48 to illustrate the details and to compare the differences between small and medium firms.

There was no statistically significant difference in mean scores of all e-b/c good practice awareness between users and non-users of website in medium firms (Appendix 5.43). Conversely, there was a statistically significant difference in the mean scores of most e-b/c awareness (except “training staff online” and “control different levels of access authority”) between the users and non-users of websites in small firms (Appendix 5.46).

There was no statistically significant difference in the mean scores of all e-b/c good practice awareness between users and non-users of ICT ad-hoc in medium firms (Appendix 5.44). Conversely, there was a statistically significant difference in the mean scores of awareness in most e-b/c good practice (except “full awareness of e-b/c regulation and law”) between users and non-users of ICT ad-hoc in small firms (Appendix 5.47).

There was no statistically significant difference in the mean scores of all e-b/c good practice awareness between users and non-users of wireless in medium firms (Appendix 5.45). Conversely, there was statistically significant difference in the mean scores of most e-b/c awareness (except “full awareness of e-b/c regulation and law” and “training staff online”) between the users and non-users of wireless in small firms (Appendix 5.48).

Using websites, ICT ad-hoc and wireless have a significant impact on the awareness of e-b/c good practice in small firms but not in medium firms. Therefore, those critical factors are more relevant to small firms rather than larger firms.

### **(c) One-way ANOVA with Post Hoc Tests**

A range of interval data (Questions 16 to 30) chosen as dependent variables and five groups of nominal data (Questions 11 to 15) separately chosen as five business areas applied to the one way ANOVA with Post Hoc Tests. One-way ANOVA was applied to identify statistically

significant differences in the mean scores of e-b/c good practice across the groups (different level e-b/c activities) in each business area. The option of 'means plots' was chosen to demonstrate and compare the mean scores for the different groups in each business area. When the significant differences were identified, Post-hoc tests were then used to discover where these differences lie.

Summarised results from One-Way ANOVA tests (Appendix 5.49) shows there was at least one specific level of e-b/c activities in mean scores of some e-b/c good practice was significant different in each business area (details in Appendix 5.50, 5.52, 5.54, 5.56 and 5.58). The results also highlight the significant differences impacted on more e-b/c good practice in marketing and purchasing areas rather than other business areas:

- 1) At least one specific level of e-b/c activities in mean scores of seven e-b/c good practices were significantly different than other levels in **marketing** (Appendix 5.50):
- 2) At least one specific level of e-b/c activities in mean scores of six e-b/c good practices was significantly different from other levels in **purchasing** (Appendix 5.52):
- 3) At least one specific level of e-b/c activities in mean scores of three e-b/c good practice was significantly different from other levels in **Sales** (Appendix 5.54):

However, the results from One-way ANOVA tests did not show which level of e-b/c activity was significantly different compared with other levels particularly in marketing, purchasing and sales. Therefore, Post Hoc test was used to discover which specific level(s) of e-b/c activities was/were different than other levels (comparing mean scores between different activity levels) in each business area as follows:

- Marketing: looking into the mean scores of e-b/c good practice (Q 16, 18, 21, 22, 26 and 27) where the significant differences were

found in different levels of marketing. The result tables of Post-hoc tests clearly demonstrate that the correlation between level of marketing activities and mean scores of e-b/c good practices increase: the higher the marketing level, the higher the mean scores are. The result tables also reveal the mean scores of e-b/c good practices started to change significantly when the firms were involved in online marketing (level 3). (Appendix 5.51).

- Purchasing: looking into the mean scores of e-b/c good practice (Q22, 24, 25, 26, 29 and 30) where the significant differences were found in different levels of purchasing. The result tables of Post Hoc tests clearly demonstrate that the correlation between level of purchasing activities and mean scores of e-b/c good practices increase: the higher the purchasing level, the higher the mean scores are. The result tables also reveal the mean scores of e-b/c good practices started to change significantly when the firms involved in sourcing and payment online (level 3). (Appendix 5.53).
- Sales: The result tables of Post Hoc tests clearly demonstrate that the correlation between level of sales activities and mean scores of e-b/c good practices increase: the higher the sales level, the higher the mean scores are. The result tables also reveal the mean scores of e-b/c good practices started to change significantly when the firms involved in sourcing and payment online (level 3). (Appendix 5.55).
- Resource Management: The result tables of Post Hoc tests clearly demonstrate that the mean scores of e-b/c good practice increase when the level of resource management rises. The tables also reveal the mean scores of e-b/c good practices start to increase significantly when the firms are involved in electronic management system (level 4) (Appendix 5.57).
- Customer service: failed to run Post Hoc test in the area of customer service because the data collected could not fulfil the test requirement (Appendix 5.58).

The Post Hoc tests illustrate the participators involved in online marketing, online trading and electronic resource management systems are better performers in terms of e-b/c good practice.

#### **5.4 Summation of Analysis**

The questionnaire was carefully planned, developed and carried out through the whole data collection process. A number of tests were used based on a range of different data. Descriptive statistics were mainly used to classify different characteristics/profiles of the SMEs and to identify the differences between small and larger firms. Parametric tests were employed to identify, predict and present a range of important/critical factors impacted on e-b/c good practice.

##### **(1) Descriptive statistics**

Descriptive statistics showed the following key points:

- There was a significant identifiable difference between small and medium firms particularly in ICT infrastructure, ICT skills/knowledge, communication method and e-b/c motivation; larger firms generally performed much better than small firms in most of the business areas, it shows that size has certain influence in e-b/c performance.
- Service orientated firms in general perform better than manufacturing firms.
- The majority levels of e-b/c activities are very low (level 1 and 2) currently, but resource management has achieved the highest level so far.
- Half a dozen of e-b/c good practices were rated neutral or not important which either meant those practices are not the best benchmarking for SMEs or alternatively it meant lack of e-b/c awareness in SMEs.
- SMEs did not perform as well as they thought in each e-b/c good practice.



**(2) Parametric statistics/Significant tests**

- Some e-b/c good practices which relate to factors (e-b/c awareness and vision, quick response to customers, online trading, ICT infrastructure, communication) are rated as very important.
- Some important/critical factors were identified which have a significant impact on e-b/c good practice and its awareness e.g. website, ICT skills/knowledge, ICT infrastructure, communication, online marketing, online trading and electronic resource management.
- There are some significant differences between small and medium firms. Using website, ICT in-house expertise, ad-hoc and wireless might have a significant impact on small firms but not necessarily on medium firms.

The results presented an overview of e-b/c awareness and activities in SMEs and explored a range of important factors and influential e-activities impacting on e-b/c good practices. This achieved the key aims and objectives of the analysis and re-shaped the focus of the research direction for the next phase.

The results also achieved the second and third overall research objectives (see chapter 1.3 for details), which helped to produce effective e-b/c implementation methods and to provide effective advice and support for SMEs later.

The purposes of this questionnaire were fully accomplished by the findings, which effectively led to further research.

## **CHAPTER 6: CASE STUDIES**

### **6.1 Introduction**

Literature suggests that e-b/c system integration is the ultimate solution for e-business/e-commerce (e-b/c) success, but results from the questionnaire clearly suggest SMEs are less likely to have integrated or advanced e-b/c systems especially in small firms. Overall, a low level of current e-b/c activity was identified in SMEs. This is due to many significant barriers when adopting/developing e-b/c. Despite the low e-b/c integration level, firms are willing to improve their performance in many business areas especially in marketing e-activities. The priority of e-b/c development might not be the same in different SMEs as it depends on their business needs and e-b/c capabilities. Therefore, a range of “fixed factors” and “variable factors” influencing e-b/c good practice were identified, and helped to guide this research to explore more in-depth evidence of what and how to influence e-b/c success.

The author has been intrigued by the notion of critical success factors in e-business uptake. A research programme was undertaken, whereby a small (limited by resource and time) number of firms, covering a wide spectrum of the perceived critical business activities areas were studied.

This chapter presents the findings of each studied firm and analyses the differences between firms. Each firm is assessed based on a set of e-b/c influential factors with a scoring system. It also explains the reasons and rationale behind the case studies.

### **6.2 Reasons for the case studies**

A questionnaire alone would not have provided sufficient insight of e-b/c success in small firms. Therefore, an interview approach was also needed because interviews often explore deeper insights into the

complex situation offered by respondents' valuable opinions that the researcher may not have considered (Gary, 2004).

Fourteen firms were interviewed, which subsequently converted into fourteen case studies based on the author's observation and judgement as Yin (1998) recommended that the case study method primarily referred to as interview method. Case studies were considered an excellent technique for this research as they rely on direct observation. This contributes important factors to our knowledge and they arise out of a need to understand and explain complex phenomena and life interventions (Remenyi et. al., 1998). It is a way of establishing valid and reliable evidence for the research process, as well as presenting findings resulting from the research.

Furthermore, the purpose of the research is to establish a generic framework/self-assessment tool in order to increase e-b/c awareness and to seek appropriate strategies for business success in SMEs. Understanding SMEs' behaviour and the critical success factors for e-b/c is central to form a clear picture of how and why SMEs develop e-b/c for business growth and success. In order to underpin the e-activities that relate to each critical factor at different stages of e-b/c adoption and development, it was also essential to observe and explore e-b/c good practice and reasons for failure in SMEs. This would help to test the correlations between e-b/c good practice and those factors. Therefore, it was necessary to explore these factors and e-b/c good practice in greater detail.

The objectives of interviewing and studying the companies were to:

- Obtain qualitative data in order to achieve research objectives 3, 4, 5 and 6 (see chapter 1.3 for details).
- Reassess and validate the understandings and findings from the questionnaire and initial research.

- Extend and widen the understanding of practical success factors of e-b/c in SMEs.
- Re-define and validate the critical success factors of e-b/c in SMEs.

### **6.3 Rationale for Case Study**

#### **6.3.1 Case Study Design**

A selection of fourteen firms (see table 6.1) was chosen for study with the aim of covering a good range of the critical success factors identified from literature review, initial investigation and questionnaire. Some of the firms used in the research were those known to the author, had expressed an interest in taking part in the case studies or were provided by local business support contacts. Most importantly, the firms studied covered what was believed to be a good range of e-business activity and types of business environment. Each firm is presented anonymously in this thesis for reasons of confidentiality.

To obtain more in-depth information about the studied subject and to complement the pilot survey and questionnaire, for each firm, a form of semi-structured interview with an open discussion was held with a senior representative (often the managing director) of the firm. Each respondent was guided through a number of topic areas relating to the firm's activities and its e-business processes.

The questions and the discussions were based on a set of semi-structured questions which were generated from the previous research (mainly the questionnaire). The research project aimed to investigate SMEs in e-b/c in general. However, the priority of e-activities in each firm is different from others. Therefore, the sequence of questions asked depended on the relevance of e-b/c activities in particular business area(s) within each firm. The flexibility of the semi-structured interview

method led to open discussions and relevant and positive outcomes. This allowed us to capture in-depth and valuable information without unnecessary constraint and this information was then added to the case studies. A copy of the semi-structured interview questions (Appendix 6.1) was sent to each interview company in advance. The interview was divided into two parts and is as follows:

**Part 1: Identifying the priority of business needs**

At beginning of the interview, each company was asked to rank the importance of seven main business areas, for example, marketing, sales, customer service, purchasing, resource management, communication and collaboration. Each company was also asked why some business areas were more important than others.

**Part 2: Identifying detailed e-activities in each business area especially in the area(s) of e-b/c development**

Detailed e-b/c activities from low to high levels of applications in each business area listed. What e-b/c activities occurred at a specific level in each business area were also identified or collected. It was designed not only to explore an overview of e-b/c in SMEs but also to observe any significant e-b/c activity and good e-b/c practice in each business area.

Taking the insights of SMEs growth through adopting and using e-b/c, the case studies were undertaken to obtain data in the following areas:

- the degree of e-b/c activities in each business area
- the priority of business needs
- how e-b/c can help to achieve the business performance in each priority of business areas
- how e-b/c activities or applications are relevant to the best performing business areas
- the details of each e-b/c success factor in SMEs

The discussions were informal with the researcher making much use of her extensive business experience in order to extract the essence of the respondents' comments. In some cases, follow up discussions were held by a re-visit to the company or either via telephone to resolve any issues that seemed unclear.

The researcher then discussed each case with her supervisory team and used team judgement and experience to rank the firm's responses against a range of success/influential factors. This is summarised in table 6.2 in a later session (6.5)

### **6.3.2 Company Selection**

The case study companies were selected based on the following criteria:

- The companies are involved in e-b/c activities as a part of their business strategies.
- The companies are willing to grow or willing to implement their current e-b/c strategies.
- The companies believe e-b/c would help them to grow.
- The companies have their own priority of business development and are willing to use e-b/c for this development.
- The companies may involve significant e-b/c activities in some of their business areas.

From the above criteria, it can be seen that there is an intentional bias in the sample selection. The overall degree of e-b/c activities is very low among most SMEs but on the other hand, large companies are highly active in this area. Therefore, it was necessary to involve some of the large companies in our interviews for good practice and to spread the dimensions of the research. The companies were carefully chosen across a wide range of dimensions e.g. manufacturing vs. service companies; small vs. large companies; young vs. mature companies; technology apathetic vs. technology driven companies. Thus, the semi-structured interview was biased compared to the original population.

Since the focus of the study was shifted from surface to an in-depth degree, it is important to recognise this bias towards the chosen companies because of the focus.

Table 6.1 provides a brief description of the companies involved. This includes the sector, size (turnover and employee number), age, business market, UK head office, priority of business needs and most significant, e-b/c activities.

Studied Firms	Main Market Place	Location (head office)	Sector	No. of Employees	Turnover (£/year)	Company Age in years	Priorities for improvement & development
1	National	Bromborough	Retail/Wholesale	30	2 M	50	Marketing & Sales
2	National	Knowsley	Manufacturing	37	1.8 M	3	Sales & Communication
3	International	Liverpool	Manufacturing	50	2 M	42	none
4	Regional	Frodsham	Service	3	200 K	2.5	Customer service, Sales & Marketing
5	National	Knowsley	Manufacturing	18	0.7 M	30	Customer service, Sales & Marketing
6	National	Liverpool	Hotel/Restaurant	14	350K	17	Customer service, Sales & Marketing
7	National	Liverpool	Service	5	negligible	1	Marketing
8	National	Liverpool	Manufacturing	25	2 B	86	Integration of whole business process
9	International	Liverpool	Manufacturing	60	1.8 M	48	Sales, Marketing & Communication
10	National	Liverpool	Manufacturing	40	3.5 M	167	Sale & Communication
11	National	Knustsford	Manufacturing	200	7 M	43	Integration of whole business process
12	International	Harlow	Manufacturing	6000/45(UK )	1.9 B	9	Business control, integration & efficiency
13	National	Essex	Banks & Insurance	350	6.9 M	42	Sales & Customer Service
14	International	London	Telecommunications	431800	4870 M	160	Integration of whole business process

**Table 6.1** Brief description of studied firms

#### 6.4 Case Studies

A brief account of each company studied is introduced (see attached Appendix 6.2 to 6.15), a summary of key findings are as follows:

### **6.4.1 Main findings from each case study**

#### **Case study company number 1 (Appendix 6.2)**

A service based company which uses two of their websites generating five to ten percent annual revenue for the company.

Web-marketing has been one of the strong features which helped to generate up to ten percent new business for the company last year.

The CRM (Customer Relationship Management) system is being actively used to collect and analyse customers' profiles in order to provide a swift response to customer enquiries.

It seems e-b/c activities have been heavily emphasised in marketing and customer service areas, but not other business areas due to the service orientated nature of the company.

#### **Case study company number 2 (Appendix 6.3)**

A typical manufacturing company, the e-b/c activities are kept at a minimal level although the company realised the benefits that they may bring. Lack of e-b/c capabilities including ICT infrastructure, in-house ICT expertise and website presence are the main reasons preventing the company evolving e-b/c.

The company wants desperately to achieve better performance in sales and customer service. Web-marketing and online trading were the key strategies for business development but it appears that the company is struggling to achieve e-b/c success without proper e-b/c capabilities.

#### **Case study company number 3 (Appendix 6.4)**

A family owned, manufacturing business which has been long established with continuously growing service elements. The business relies purely on its long-established reputation and speciality in the niche products that



are dealt with by internal product expertise. Although the company has the strength in a niche market by producing high quality products with no direct competitors in the field, they are not moving forward and will not survive if the current situation remains the same.

In the current situation, some basic e-activities were identified e.g. using email to communicate with their customers, staff and suppliers and having a website presence for publicity. The company has no commitment, awareness and plans for e-b/c. Therefore, effort and investment are not being spent on ICT infrastructure, ICT skills or new technologies.

E-business activities are not in their best interests due to numerous reasons: a) the complexity of the products does not suit online trading b) lack of e-b/c vision and goals c) management are not comfortable with new technologies and d) unsure what e-b/c can do for them.

It seems the business operation is breaking down. The current manual systems have created the following problems:

- 1) Lack of new customers
- 2) Low customer satisfaction
- 3) Slow customer response
- 4) Shortage of supply

#### **Case study company number 4 (Appendix 6.5)**

A young, service based company, the business is open-minded and positive towards e-b/c. Web-marketing and a rapid response to their customers are the current key objectives. Currently, the company is adopting a MS CRM system which can work with Outlook, actively managing customer data and promoting the business. An e-b/c system will be in place to respond to customer enquiries in a timely manner. Being an ICT service provider, having an integrated ICT infrastructure and possessing the relevant knowledge and skills helps them to rapidly progress with e-b/c development.

**Case study company number 5 (Appendix 6.6)**

A long established manufacturing company. The company's integrated Business Management System has helped them to build up a strong customer base, both domestically and internationally. An excellent reputation has been achieved based on the company's responsive, customer driven approach to developing and manufacturing innovative cost effective solutions for temperature measurement and control applications. E-business applications are being applied in sales and purchasing through the company's website. Having in-house ICT expertise, knowledge/skills and integrated ICT infrastructure enhances the e-b/c development. However, an integrated e-b/c system does not yet exist but will be implemented in the near future by utilising the strength of their ICT capabilities.

**Case study company number 6 (Appendix 6.7)**

An independent hotel not based in a prime location, and it began trading in 1989. The hotel currently employs fourteen staff with an annual turnover of £350K. The occupancy rate of the hotel is approximately sixty eight percent which is ten percent higher than the average occupancy rate of city centre based hotels.

Having clear e-b/c strategies for their business greatly increases the opportunity of business growth. E-b/c activities are found in sales, marketing and customer services but not in resource management or purchasing.

The company's success is based on exceptional customer service and the ability to obtain new customers as well as retaining existing ones. A booking system, electronic feedback facility and CRM system are fully used to achieve the goal.

Web-marketing helps the company attract fifty percent of new customers every year and also creates a platform for e-collaboration.

The sales channels are successfully extended through e-collaboration. Only two percent of the new sales are generated through their own website due to the initial error of web design (price and availability are fixed on the website) which restricted potential sales volume through their own website. Fifteen percent of the sales are obtained through their trading partners' websites and the rest through the B2B market place. It clearly shows any technical obstacle can damage a winning business, and also demonstrates the importance of e-collaboration.

#### **Case study company number 7 (Appendix 6.8)**

A very young (1 year old) IT service provider. The company has intensive ICT knowledge and skills, adopting and developing e-b/c. However, the company has no goals, plans or strategies in terms of e-b/c. The owner's attitude towards e-b/c is not certain and their website does not support online trading.

Although they hope to be involved in web-marketing and CRM via their website, they have yet to be actively involved because of the lack of the agreement from top management. The e-b/c solution is a long way down the track.

#### **Case study company number 8 (Appendix 6.9)**

A young service orientated business, which provides an electronic facilitation service between buyers and sellers (B2B) at the SME level. At present, the company only employs 25 staff.

This company demonstrates that even a small business can achieve business success through e-b/c continuous implementation. Web-marketing and online trading are state of the art and are channels for generating sales and attracting new customers. Speedy customer service (managed online) maintains a high level of customer satisfaction. Online purchasing and resource management increases the operating efficiency. E-b/c activities through an integrated system helped to

improve business performance in all business area(s) that are supported by in-house ICT expertise, the sophisticated ICT infrastructure and website and the owners' drive and e-b/c intention and strategies. The e-b/c vision and goals are clear, the commitment is persistent, the company is continuously growing through e-b/c activities that will help them to achieve new business ideas.

ICT capability is the core competence. Exploring and utilising technology are driven by business needs based on a tailored e-b/c strategy.

#### **Case study company number 9 (Appendix 6.10)**

A long established manufacturing company fighting for survival. E-business has helped the company to stay in business amongst the competition. Web-marketing, CRM and the website enhances their ability to attract potential customers and also accelerates the speed in dealing with customers' enquiries. However, the speed of adopting new technology is very slow. Overall, ICT capabilities and more effective strategies are required in order to improve business competitiveness.

#### **Case study company number 10 (Appendix 6.11)**

A long established manufacturing company, who have realised the competitiveness and the benefits of e-b/c. Cost, ICT infrastructure, adaptability of changes, e-b/c strategies, ICT knowledge and skills are the main barriers preventing the company from being involved in e-b/c activities. It seems the business is relying on repeat customers, but the response to them is very slow and this makes the business less attractive than it should be. Adopting web-marketing seems to be the priority but not without the knowledge and skills to make the change.

#### **Case study company number 11 (Appendix 6.12)**

A family run, large manufacturing company. Web-marketing is the area that the company has invested the most time on and it seems this is the only solution to remain in this extremely competitive market, helping the

company to generate a large volume of sales. To improve internal efficiency, the current business priority is integration through acquisition of a new ERP system to simplify the purchasing process. The company also hopes to adopt online ordering mainly for existing customers in the next 18 months. Using e-b/c application in customer service is a strength of the business. A clear e-b/c strategy of having an integrated system (ERP) to simplify the business process will be helped by existing ICT knowledge and skills within the company. Improvement to the website and ICT infrastructure are needed to execute the strategy.

### **Case study company number 12 (Appendix 6.13)**

A large global manufacturing company with strong service elements. The e-b/c activities facilitate business process improvements. A fully integrated electronic system has achieved the control of business processes e.g. planning and control of stocks, replenishment of orders to manufacturing sites, control of deliveries to customers (warehousing and distribution is done by a contractor). The system allows the business to run smoothly and efficiently.

CRM system analyses and manages customer information from sales records. This enhances the sales force and their ability to deal with customers.

Integration, communication and marketing are the current priorities, which can be improved by using e-b/c. A website is being created to project and share corporate information. Additional features and benefits will be added to the website so that online trading can be fully achieved. The e-b/c orientation, vision, plans and strategies will continuously implement the e-b/c system by investing in technologies for business purpose.

### **Case study company number 13 (Appendix 6.14)**

A long established large service company. ICT knowledge and skills are obviously extensive and the ICT infrastructure is fully integrated, supporting all business activities automatically and electronically.

Web-marketing, online trading and online customer service are state of the art and are strong features of the business, securing business success.

The company websites are fully functional and highly integrated, linking with their trading partners' systems. Orders are referred from their partners' websites. E-collaboration is vital for industries which are deemed to be mature.

Internal communication is extremely efficient through their e-b/c system. Electronic forms are not needed in resource management and purchasing due to the nature of the business.

They are aware of the fast change of new technologies and the competitiveness in the insurance industry. An integrated e-business system is an essential tool for the company. This makes a big difference to the business; new technology and software used enables their e-business success based on the business needs.

#### **Case study company number 14 (Appendix 6.15)**

One of the world's leading providers of communications solutions serving customers in Europe, the Americas and Asia Pacific. The company is highly driven by ICT. The ICT infrastructure is obviously extensive and fully integrated supporting all business activities automatically and electronically.

They have a sophisticated website which fully supports a wide range of online activities i.e. web-marketing, CRM, online trading, virtual community and real time customer feedback. Web-marketing is actively engaged via traditional marketing activities e.g. search engine promotion, web seminars, email promotions, banner exchange, online-discussion and virtual communities in order to increase sales and new customers.

The CRM system can capture all customer information directly and then respond to all enquiries in a timely manner.

An e-procurement system (an Intranet site) is directly integrated with their suppliers. The system allows procurement staff to access the site and purchase anything from stationery items to airline tickets. It is also highly integrated with other departments such as finance and administration which informs an automatic and electric business process.

The company has been transformed into an interactive electronic organisation. These e-b/c applications have been driven by their strategies and accomplished by the ICT competences.

### **6.3.2 Summarised findings from the case studies**

Only one out of ten small firms has an integrated e-b/c system. Most small firms still use manual systems comfortably where they can use their tacit knowledge and skills without too much cost. A fully integrated e-b/c system is not the reality at the moment in most small firms. However, e-b/c activities/applications have changed the way of doing business, increased efficiency, improved business performance and brought many other benefits to the businesses.

Overall, the service-orientated firms are more proactive towards e-b/c than the manufacturing companies. Most of them need to deal with a large number of customers whereas most small manufacturing firms only deal with a few key customers and suppliers. The benefits and return of ICT investment cannot be justified from an integrated e-b/c system, thus, it is not needed in small manufacturing firms. Conversely, most service orientated firms recognise the benefits and demand for e-b/c activities and applications through a fully integrated system. Generating profits

and satisfying customers' needs are the key motivation of adopting and developing e-b/c. Therefore, proactive e-activities and advanced e-b/c applications are normally found in business areas e.g. marketing, sales and customer service but are found less or even not needed in resource management or supply chain management.

Young firms are more open and willing to engage in new technology than long established family run firms. Small firms, especially the micro size firms are not likely to be as well equipped as the larger companies in the same industry. The research identified that most small firms are not capable enough to develop an e-b/c system especially because of lack of ICT infrastructure or skills or both. Service orientated firms are not interested in developing e-b/c activities in purchasing and resource management because of its service nature.

Web-marketing, online trading and CRM systems are the most popular e-b/c applications which drive e-b/c success. The research identified that e-b/c capabilities are the foundation of any advanced e-b/c activity. The capabilities include a functional website, effective communication, ICT infrastructure and skills. They are not only the foundation of e-b/c development but are also the most important factors for e-b/c success based on appropriate strategies but not technology itself.

Throughout the observation, the author identified that each company is a unique case in terms of adopting and developing e-b/c. The studied companies agreed with the author that although some factors e.g. size, age, service orientation, product complexity, and supply chain pressure are highly influential to e-b/c success, they are very difficult to change over a short period of time. If a firm takes all the advantages of those



factors, they are more willing to develop e-b/c and more likely to pursue the higher level of e-b/c integration. Not every company is suitable for e-b/c development or needs an integrated e-b/c system. If a firm is in the category of all the disadvantages of those factors, it might be extremely difficult to persuade them to adopt or develop e-b/c systems. Regardless of the diversity and inflexible situations in SMEs, the author also identified some common critical success factors which can help to improve e-b/c performance. These are a set of influential/variable factors e.g. website, web-marketing, ICT knowledge/skills, ICT infrastructure, resource management, customer management, internal communication, e-b/c vision and strategies. Firms can improve the areas to different levels based on their business needs, which is likely to lead them to the success of e-b/c adoption and development.

However, it is very common for firms to be able to achieve some of the factors, but not others, depending on ICT competences, business needs/priorities and e-b/c vision and strategies.

### **6.5 Summary of fixed and variable factors**

According to the findings from the case studies, it is clear that a range of critical success factors have a significant impact on e-b/c success in SMEs. They can be classified into two categories, fixed factors (Appendix 6.16) and variable factors (Appendix 6.17) as follows:

- 1) **Fixed factors** are those can be considered in the short term as being outside the scope of the firm to change. They are:

**AGE (F1):** rated on a scale of newly established (less than 3 years) as 0 to mature business (over 50 years) as 4.

**SIZE (F2):** rated on number of employees (0: less than 10 employees, 1: 11-49 employees, 2: 50-149, 3: 150-250 and 4: 251-500)

**SERVICE ORIENTATION (F3):** rated on level of service elements (0: totally manufactured product with no service element, 1: manufactured product with low service element to 4: no physical product and totally service based company).

**PRODUCT NATURE (F4):** rated according to its complexity and online selling potential (0: high product complexity less online selling potential to 4: low complexity more online selling potential)

**SUPPLY CHAIN (F5):** rated on the supply chain pressure (from 0: being on an axis of low supply pressure to 4: high supply pressure)

All of the factors above are to be regarded as fixed, since the firm being assessed has no influence over any of them; age is a given, size cannot be varied in the short term and the nature of the product, in its wider sense embracing both physical (manufactured) and abstract (service) is wholly determined by the market place and the nature of the product being offered.

2) **Variable factors** are those in which a firm has set its position however intentionally and which could be changed in the short term by the firm directly.

**ICT KNOWLEDGE/SKILLS (V1):** rated on degree of internal ICT knowledge and skills (from 0: company does not have any relevant ICT knowledge and skills to 4: knowledge/skills intensive typified by in-house ICT expertise).

**ICT INFRASTRUCTURE (V2):** rated on degree of ICT system integration (from 0: company only has standalone PCs with no Internet connection to 4: a full integrated system that is typified by CRM, ERP and other integrated business systems).

**WEB-MARKETING (V3):** rated on in-depth of marketing activities (0: no marketing activities, 1: traditional marketing activity only to 4: a wide range of advanced web-marketing activities with off-line promotion of the website).

**WEBSITE (V4):** rated on functionality of website (from 0: no website, 1: web presence only to 4: a sophisticated website that supports a wide range of e-b/c activities e.g. online trading and purchasing).

**RESOURCE MANAGEMENT (V5):** rated on degree of electronic system application (from 0: manual system to 4: an integrated electronic system).

**CUSTOMER MANAGEMENT (V6):** rated on speed of response to customers (from 0: answer customers' enquiries typically through letters to 4: manage customers through e-b/c system in a real time).

**e-VISION & STRATEGY (V7):** rated on degree of owners' vision of e-b/c ( from 0: no change, no commitment and awareness of e-b/c to 4: clear goals and strategies of using e-b/c for growth).

**INTERNAL COMMUNICATION (V8):** rated on methods of communication (from 0: phone and fax to 4: electronic communication and information sharing that is typified by Extranet).

Each factor was assessed against a scoring system (0: lowest level to 4: highest level); the result is displayed in the table 6.2 of following section 6.5. The given score of each factor was based on careful observations,

interpretation from the semi-structured interviews with the studied firms and the research into the firm.

## 6.6 Case study analysis

### 6.6.1 Summarised factors scoring table

Although the paths to e-b/c success and business growth are different in SMEs, the notion of critical success factors in e-b/c uptake and development can be measured by a scoring system. Through a framework based on a set of internal/variable factors, both can help to assess a firm's e-b/c position and also help them to identify realistic future improvement. A set of fixed factors in which they are obliged to operate the success should also be considered within the process of e-b/c development.

Studied firms	F1	F2	F3	F4	F5	V1	V2	V3	V4	V5	V6	V7	V8
1	3	1	4	4	1	3	3	4	3	1	4	3	2
2	0	1	0	0	4	3	3	2	0	1	1	2	1
3	3	2	2	0	4	2	1	0	1	1	2	0	1
4	0	0	4	4	0	4	3	3	1	1	2	3	2
5	2	1	1	3	4	4	3	1	3	2	2	3	2
6	1	1	4	4	0	3	3	4	3	1	4	4	2
7	0	0	4	4	0	4	3	2	1	0	2	1	2
8	4	1	3	3	4	4	4	4	4	4	4	4	4
9	3	2	1	2	3	2	1	3	1	2	2	2	2
10	4	1	0	0	4	2	0	1	1	1	2	1	1
11	3	4	2	3	4	4	2	4	1	1	3	3	2
12	1	4	2	4	3	4	4	4	1	4	4	4	4
13	3	4	4	4	0	4	4	4	4	4	4	4	4
14	4	4	3	4	2	4	4	4	4	4	4	4	4

**Table 6.2:** Summarised factors scoring framework

Table 6.2 assessed the studied firms by given scores based on the above a range of fixed and variable factors and is as follows:

### 6.6.2 Cross case analysis

Each studied firm was analysed and assessed against a set of factors in Table 6.2. It was considered more instructive to analyse two or more firms; either in pairs or in clusters on the same scoring table and attempt to rationalise the differences. For a set of 14 firms studied, there are thus many comparison possibilities so the comparisons attempted were those where the differences in the e-b/c development could be satisfactorily absorbed into the analytical process. The cross case analysis was divided into two key parts:

- (1) impact of fixed factors
- (2) impact of variable factors

The following tables clearly show the e-b/c positions and the differences of compared firms by given scores of each assessed factor and the total scores of variable factors as follows:

#### (1) Impact of fixed factors to e-b/c success

##### (a) Young firms are disadvantaged in e-b/c

Table 6.3 shows young firms that have been established less than three years are disadvantaged in e-b/c. Most of them are micro size (less than 10 employees).

Case No	age	size	service orientation	product nature	supply chain	ICT skills	ICT infrastructure	web marketing	website	resource mgt	customer Mgt	e-vision strategy	internal coom.	Total
2	0	1	0	0	4	3	3	2	0	1	1	2	1	13
4	0	0	4	4	0	4	3	3	1	1	2	3	2	19
7	0	0	4	4	0	4	3	2	1	0	2	1	2	15
6	1	1	4	4	0	3	3	4	3	1	4	4	2	24
12	1	4	2	4	3	4	4	4	1	4	4	4	4	29
5	2	1	1	3	4	4	3	1	3	2	2	3	2	20
1	3	1	3	3	1	3	3	4	3	1	4	3	2	23
3	3	2	2	0	4	2	1	0	1	1	2	0	1	8
9	3	2	1	2	3	2	1	3	1	2	2	2	2	15
11	3	4	2	3	4	4	2	4	1	1	3	3	2	20
13	3	4	4	4	0	4	4	4	4	4	4	4	4	32
8	4	1	3	3	4	4	4	4	4	4	4	4	4	32
10	4	1	0	0	4	2	0	1	1	1	2	1	1	9
14	4	4	3	4	2	4	4	4	4	4	4	4	4	32

**Table 6.3** Influence of age

Although young firms seem very open-minded to the concept of e-b/c in comparison with mature firms, they are also willing to equip themselves with high ICT skills and invest in ICT infrastructure but they lack real strength in e-b/c practice. Surviving competition and pursuing sales figures are their main targets, rather than becoming involved in e-b/c which could be achieved in the next stage of their business.

If firms 2, 4 and 7 are compared with others, their e-activity levels are below the average and they have not achieved the eight variable success factors. None of them do not have clear e-b/c vision and strategy and in particular they do not have functional websites that facilitate active engagement in web-marketing and other vital activities. Most of them think the customer relationship is vital to the business but they are not able to take the action without a clear vision. Whilst mature firms are ready to improve internal efficiency and system integration, young firms only hope to use e-b/c system to seek new customers, to enhance their sales channel and to improve their customer service. Such dissimilar priorities are at a different maturity of the business process causing diverse needs in their e-b/c adoption and development.

### **(b) Size vs. integration**

There are significant differences in terms of e-b/c integration between small (less than 50 employees) and large companies (over 250 employees). Overall, large firms are better performers than small firms with highest total scores, but in an exceptional case a small firm can also achieve e-b/c success by improving all critical areas to an advanced level. All large firms are ICT advanced and have clear e-b/c vision and strategies. Thus, they are willing to invest in new technologies according to their business needs and priorities. Most of them have integrated e-b/c systems and achieved the highest scores in each critical/variable success factor (see Table 6.4).

Case No	age	size	service orientation	product nature	supply chain	ICT skills	ICT infrastructure	web marketing	website	resource mgt	customer Mgt	e-vision strategy	internal coom.	Total
4	0	0	4	4	0	4	3	3	1	1	2	3	2	19
7	0	0	4	4	0	4	3	2	1	0	2	1	2	15
2	0	1	0	0	4	3	3	2	0	1	1	2	1	13
6	1	1	4	4	0	3	3	4	3	1	4	4	2	24
5	2	1	1	3	4	4	3	1	3	2	2	3	2	20
1	3	1	3	3	1	3	3	4	3	1	4	3	2	23
8	4	1	3	3	4	4	4	4	4	4	4	4	4	32
10	4	1	0	0	4	2	0	1	1	1	2	1	1	9
3	3	2	2	0	4	2	1	0	1	1	2	0	1	8
9	3	2	1	2	3	2	1	3	1	2	2	2	2	15
12	1	4	2	4	3	4	4	4	1	4	4	4	4	29
11	3	4	2	3	4	4	2	4	1	1	3	3	2	20
13	3	4	4	4	0	4	4	4	4	4	4	4	4	32
14	4	4	3	4	2	4	4	4	4	4	4	4	4	32

**Table 6.4** Size vs. integration

In an exceptional case, Table 6.4 shows a small firm (firm 8) which achieved the highest scores in all variable factors and the total score. The company performed even better than a large firm (firm 11) in some areas. This indicates that although size has its influence on e-b/c success small firms can be more competitive and successful than a larger firm by achieving a set of critical success factors.

**(c) Service Orientation, Products' complexity and supply chain**

Table 6.5 shows the correlation between service orientation, product nature and the supply chain pressure. There are two different clusters as follows:

Case			service	product	supply	ICT	ICT	web		resource	customer	e-vision	internal		
No	age	size	orientation	nature	chain	skills	infrastructure	marketing	website	mgt	Mgt	strategy	coom.	Total	
2	0	1	0	0	4	3		3	2	0	1	1	2	1	13
10	4	1	0	0	4	2		0	1	1	1	2	1	1	9
5	2	1	1	3	4	4		3	1	3	2	2	3	2	20
9	3	2	1	2	3	2		1	3	1	2	2	2	2	15
3	3	2	2	0	4	2		1	0	1	1	2	0	1	8
12	1	4	2	4	3	4		4	4	1	4	4	4	4	29
11	3	4	2	3	4	4		2	4	1	1	3	3	2	20
1	3	1	4	4	1	3		3	4	3	1	4	3	2	23
8	4	1	3	3	4	4		4	4	4	4	4	4	4	32
14	4	4	3	4	2	4		4	4	4	4	4	4	4	32
4	0	0	4	4	0	4		3	3	1	1	2	3	2	19
7	0	0	4	4	0	4		3	2	1	0	2	1	2	15
6	1	1	4	4	0	3		3	4	3	1	4	4	2	24
13	3	4	4	4	0	4		4	4	4	4	4	4	4	32

**Table 6.5** Service orientation and product nature

Cluster 1 (firm 2, 3 and 10): Poor e-b/c performers, which normally have complex product process/requirements with high supply chain pressure but less service elements.

Cluster 2 (4, 6, 7 and 13): Above average e-b/c performers, which normally are service orientated firms with less supply chain pressure and certainly not involved in any complex product process.

Firms in cluster 1 are small traditional British manufacturing companies. They limit themselves with regular key customers and suppliers. The products normally involve high complexity including design, process and requirement. Those firms are less likely to have or even do not need e-b/c. The nature of the product limits the e-b/c potential, which has a negative impact on the whole business performance.

Firms in cluster 2 are highly service orientated firms with no pressure from the supply chain or product complexity. The e-b/c model is usually highly acceptable in those firms. They normally perform quite well and they are in a better position to be successful, but this is not possible if other critical success factors have not been achieved.



**(d) Insignificant impact of supply chain**

Table 6.6 shows that the degree of supply chain pressure does not necessarily have an impact on the overall e-b/c performance.

Case		service		product		supply		ICT		web		resource		customer		e-vision		internal		Total
No	age	size	orientation	nature	chain	skills	infrastructure	marketing	website	mgt	Mgt	strategy	coom.							
4	0	0	4	4	0	4	3	3	1	1	2	3	2						19	
7	0	0	4	4	0	4	3	2	1	0	2	1	2						15	
6	1	1	4	4	0	3	3	4	3	1	4	4	4						24	
13	3	4	4	4	0	4	4	4	4	4	4	4	4						32	
1	3	1	3	3	1	3	3	4	3	1	4	3	2						23	
14	4	4	3	4	2	4	4	4	4	4	4	4	4						32	
12	1	4	2	4	3	4	4	4	1	4	4	4	4						29	
9	3	2	1	2	3	2	1	3	1	2	2	2	2						15	
2	0	1	0	0	4	3	3	2	0	1	1	2	1						13	
5	2	1	1	3	4	4	3	1	3	2	2	3	2						20	
3	3	2	2	0	4	2	1	0	1	1	2	0	1						8	
11	3	4	2	3	4	4	2	4	1	1	3	3	2						20	
8	4	1	3	3	4	4	4	4	4	4	4	4	4						32	
10	4	1	0	0	4	2	0	1	1	1	2	1	1						9	

**Table 6.6** Insignificant supply chain impact

When cluster 1 (firm 4, 7, 6 and 13 which are service orientated companies with no supply chain pressure) and cluster 2 (2, 5, 3, 11, 8 and 10 which are manufacturing based companies with the highest supply chain pressure) are compared, the total scores of their e-b/c performances vary from the worst to the best, especially in cluster 2. Overall, the service companies in cluster 1 performed better than manufacturing companies in cluster 2. The result suggests that companies without any supply chain pressure might find it easier to adopt and develop e-b/c than those with heavy supply chain pressure. The result also indicates that companies with heavy supply chain pressure can also achieve e-b/c success.

For example, firms 5 and 3 are both involved in a heavy supply chain. Firm 5 has built up a strong customer base, both domestically and internationally. Their reputation has grown based on their responsive, customer driven approach to developing and manufacturing innovative cost effective solutions to temperature measurement and control. The firm has approximately 300 suppliers but only uses 30-40 regularly on an approved supplier list. They currently have a project underway to reduce

the supplier numbers. Customer ordering frequency is monitored by an Excel spreadsheet. Purchasing is via Internet and telephone based on regular stock and sale review using capacity planning techniques. Stock control is by an Access database.

Firm 3 has two main business activities, and it is the bespoke design and manufacture of glassmaking equipment that is being studied here. The business relies on word-of-mouth. There is not any system to manage customers and suppliers and each job involves more than two suppliers. Conversely, firm 3 has not established any electronic system to manage or monitor their customers or suppliers. They reject their customers when demand exceeds the capability. The purchase is based on the job itself and the supplier(s) may repeat or select new each time through a complex manual system. The relationship has dealt with their own knowledge and business sense accordingly. The internal inefficiency slows down the business, and although the uniqueness of the business attracts many international customers it seems they are struggling to fulfil the demand and expand the business.

The analysis suggests that supply and resource management is needed to achieve e-b/c success when firms are in higher supply chain pressure.

In conclusion, Table 6.3 to Table 6.6 illustrated that the fixed factors e.g. age, size, service elements, product complexity and supply chain have a certain degree of influence on e-b/c performance, but they are not direct causes to e-b/c success or failure. Although those factors might not be improved within the short period of time, SMEs certainly should be aware of them.

## **(2) Variable factors are the keys to e-b/c success**

A set of variable factors proved to be the critical success factors to e-b/c success in SMEs.

**(a) Variable factors impact on overall e-b/c performance**

Table 6.7 shows firms that achieved higher scores in variable factors are better e-b/c performers. In contrast, failure to achieve scores in each variable factor, highlighted the worst e-b/c performers.

Case No	age	size	service orientation	product nature	supply chain	ICT skills	ICT infrastructure	web marketing	website	resource mgt	customer Mgt	e-vision strategy	internal coom.	Total
3	3	2	2	0	4	2	1	0	1	1	2	0	1	8
10	4	1	0	0	4	2	0	1	1	1	2	1	1	9
2	0	1	0	0	4	3	3	2	0	1	1	2	1	13
7	0	0	4	4	0	4	3	2	1	0	2	1	2	15
9	3	2	1	2	3	2	1	3	1	2	2	2	2	15
4	0	0	4	4	0	4	3	3	1	1	2	3	2	19
5	2	1	1	3	4	4	3	1	3	2	2	3	2	20
11	3	4	2	3	4	4	2	4	1	1	3	3	2	20
1	3	1	3	3	1	3	3	4	3	1	4	3	2	23
6	1	1	4	4	0	3	3	4	3	1	4	4	2	24
12	1	4	2	4	3	4	4	4	1	4	4	4	4	29
13	3	4	4	4	0	4	4	4	4	4	4	4	4	32
8	4	1	3	3	4	4	4	4	4	4	4	4	4	32

**Table 6.7** Overall performances

For example, firms 3 and 10 scored much lower than firms 13 and 8 in each variable factor. Firms 13 and 8 also achieved the highest in total scores through a highly integrated e-b/c system, but firms 3 and 10 are fighting for survival.

From a strategic viewpoint, firms 3 and 10 have much to do if they are to emulate firms 13 and 8 in terms of e-b/c excellence. Increased focus on customer management would enhance the profile and probably business level, but this must be accompanied by the adoption of an improved resource management system. This in turn would require better in-house expertise to make such a system work and deliver necessary control benefits. ICT capabilities which includes ICT skills, ICT infrastructure and a website are the key factors influencing e-b/c performance. There are also the differences in product nature and service orientation which are not adaptable. Firm 8 is a service orientated business that transformed

from a traditional manufacturing company; such change enhanced their competitiveness in the dynamic business world. Business success is unlikely to happen to firm 3 and 10 unless the owners inject appropriate effort to accomplish the variable success factors.

### (b) ICT capabilities impact on e-b/c performance

Table 6.8 shows that ICT capabilities especially ICT skills and infrastructure have significant impact on e-b/c performance.

Case No	age	size	service orientation	product nature	supply chain	ICT skills	ICT infrastructure	web marketing	website	resource mgt	customer Mgt	e-vision strategy	internal coom	Total
10	4	1	0	0	4	2	0	1	1	1	2	1	1	9
3	3	2	2	0	4	2	1	0	1	1	2	0	1	8
9	3	2	1	2	3	2	1	3	1	2	2	2	2	15
11	3	4	2	3	4	4	2	4	1	1	3	3	2	20
2	0	1	0	0	4	3	3	2	0	1	1	2	1	13
6	1	1	4	4	0	3	3	4	3	1	4	4	2	24
1	3	1	3	3	1	3	3	4	3	1	4	3	2	23
4	0	0	4	4	0	4	3	3	1	1	2	3	2	19
7	0	0	4	4	0	4	3	2	1	0	2	1	2	15
5	2	1	1	3	4	4	3	1	3	2	2	3	2	20
12	1	4	2	4	3	4	4	4	1	4	4	4	4	29
13	3	4	4	4	0	4	4	4	4	4	4	4	4	32
8	4	1	3	3	4	4	4	4	4	4	4	4	4	32
14	4	4	3	4	2	4	4	4	4	4	4	4	4	32

**Table 6.8** Importance of ICT skills and infrastructure

Firms 12, 13, 8 and 14 are the best e-b/c performers amongst the 14 studied companies. They also have the highest scores in ICT skills and ICT infrastructure. Conversely, firms 10 and 3 have the lowest scores in ICT skills and ICT infrastructure and are the worst e-b/c performers.

When comparing firms 10 and 8, they are both mature small manufacturing firms with a similar age who operate in highly pressurised supply chains. Firm 8 is no longer a manufacturer, instead they buy in and resell their products. Thus their business is based on offering a high level of service to its customers using advanced e-b/c processes. The firm operates a Vendor Managed Inventory (VMI) electronically, taking over the entire process of forecasting usage, stock replenishment and

management. It is currently attempting to outsource their system to other firms to generate extra sales. The business development is driven by the firm's MD, who is highly IT literate and visionary in respect of the potential for systems. Firm 10 is a traditional manufacturer of packaging items, struggling to cope with ever more demanding customers in an increasingly volatile marketplace, and with inadequate IT systems (at least in respect of resource management). Their ICT skills are limited with no in-house expertise. After realising the problem, the current effort is to establish an IT centre. The result is a highly polished customer service system acting as a differentiator from more complacent competition. The IT centred effort will be on improving resource management, through better machine scheduling, stock control, and cost data collection but without a supportive ICT infrastructure and appropriate skills. In comparison, it clearly shows that using ICT based on strategic business needs is the key to success and ICT capabilities are vital to business success. The ICT infrastructure is the foundation that is able to facilitate the business process and transformation and in addition companies need ICT skills to execute the transformation.

### **(c) Importance of website**

All SMEs are encouraged to have a website under the UK government's initiative, but not every company has a website yet and half of the companies' websites only feature a web presence that is predominantly used for publishing information. Therefore, the functionality of a company's website either constrains or achieves the e-b/c activities based on the business needs. Two clusters are clearly represented in Table 6.9 to demonstrate the importance of websites as follows:

Case No	age	size	service orientation	product nature	supply chain	ICT skills	ICT infrastructure	web marketing	website	resource mgt	customer Mgt	e-vision strategy	internal coom.	Total	
2	0	1	0	0	4	3		3	2	0	1	1	2	1	13
4	0	0	4	4	0	4		3	3	1	1	2	3	2	19
7	0	0	4	4	0	4		3	2	1	0	2	1	2	15
12	1	4	2	4	3	4		4	4	1	4	4	4	4	29
3	3	2	2	0	4	2		1	0	1	1	2	0	1	8
9	3	2	1	2	3	2		1	3	1	2	2	2	2	15
11	3	4	2	3	4	4		2	4	1	1	3	3	2	20
10	4	1	0	0	4	2		0	1	1	1	2	1	1	9
6	1	1	4	4	0	3		3	4	3	1	4	4	2	24
5	2	1	1	3	4	4		3	1	3	2	2	3	2	20
1	3	1	4	4	1	3		3	4	3	1	4	3	2	23
13	3	4	4	4	0	4		4	4	4	4	4	4	4	32
8	4	1	3	3	4	4		4	4	4	4	4	4	4	32
14	4	4	3	4	2	4		4	4	4	4	4	4	4	32

**Table 6.9:** Importance of website

Cluster 1 (firms 6, 5, 1, 13, 8 and 14) shows that better e-b/c performance is guaranteed for a firm with a functional website that supports a wide range of advanced e-b/c applications e.g. online trading, online purchasing or e-customer service. If we compare firm 1 and firm 9, both are long established businesses and both are suitable for the option of the e-b/c model. The comparison clearly shows the feature and the functionality of their websites which determine business success as follows:

Firm 1 has provided over 50 years of service to the audio visual and presentation market as well as providing an excellent range of equipment. The company has two websites with both national and international domain names for trading purposes. The UK website is mainly used for the conference service division and the trading of AV equipment. Their international website is a fully functional data based driven website that supports online ordering and purchasing which generates 5%-10% of the revenue for the company. The website not only has its own online service booking (including transaction and training systems) but also actively engages in web marketing and e-customer service (customer data system and mailing lists). Internal business efficiency, brand awareness, sales channels and customer management have improved

through these websites which fully enhanced their ability to support and facilitate a wide range of other advanced level of e-b/c activities. In addition, the company is in a position to integrate the whole e-b/c system when needed.

Conversely, firm 9 is one of the UK's leading headwear producers. The family business (as most SMEs are) is renowned for its high quality production capability and strong brand image. Around 80 per cent by volume is sourced outside the UK, (Poland, the Czech Republic and Bulgaria) therefore the service elements have increased because of a changed business process. As the in-house manufacturing becomes more niche and specialist, the firm will benefit from more advanced product presentation through their website. However, having a website which is basically a catalogue is not regarded as an e-commerce site. The website does not support the business needs and this in turn limits the business development in a significant way. A sophisticated website is absolutely essential for successful e-b/c because it facilitates and supports, for example, online purchasing, online ordering and other e-activities.

#### **(d) Impact of web-marketing**

It appears that web-marketing is a popular activity amongst the companies. This enables them to attract potential customers and also to promote the businesses regardless of sector. Advanced web-marketing in an appropriate and effective manner could directly lead the company to success. Table 6.10 clearly shows that companies highly advanced in web-marketing are also the better e-b/c performers.

Case No	age	size	service orientation	product nature	supply chain	ICT skills	ICT infrastructure	web marketing	website	resource mgt	customer Mgt	e-vision strategy	internal coom.	Total
3	3	2	2	0	4	2	1	0	1	1	2	0	1	8
10	4	1	0	0	4	2	0	1	1	1	2	1	1	9
5	2	1	1	3	4	4	3	1	3	2	2	3	2	20
2	0	1	0	0	4	3	3	2	0	1	1	2	1	13
7	0	0	4	4	0	4	3	2	1	0	2	1	2	15
4	0	0	4	4	0	4	3	3	1	1	2	3	2	19
9	3	2	1	2	3	2	1	3	1	2	2	2	2	15
12	1	4	2	4	3	4	4	4	1	4	4	4	4	29
11	3	4	2	3	4	4	2	4	1	1	3	3	2	20
6	1	1	4	4	0	3	3	4	3	1	4	4	2	24
1	3	1	4	4	1	3	3	4	3	1	4	3	2	23
13	3	4	4	4	0	4	4	4	4	4	4	4	4	32
8	4	1	3	3	4	4	4	4	4	4	4	4	4	32
14	4	4	3	4	2	4	4	4	4	4	4	4	4	32

**Table 6.10:** Importance of web-marketing

Table 6.10 shows that firms 13 and 7 are highly service orientated companies with no supply chain pressure but with strong ICT capabilities. Web-marketing certainly makes a difference in e-b/c performance.

Firm 13 has established a good reputation throughout the years. They also actively applied web-marketing into their business strategy along with traditional marketing techniques to remain competitive. The activities include traditional media, exchanging links with business partners, using keywords in hyperlinks, using META Tags, submitting URL links to a wide range of search engines, using different strategies for search engines. Email promotions such as electronic newsletters are regularly used. Using Google pay-per-click helped the company generate up to 10 per cent new business in the last year. In addition, they actively monitor competitors' websites and their web-marketing campaigns. This business success could never be achieved without successful web-marketing.

Conversely, firm 7 provides "e-commerce solutions", which is basically to provide an electronic facilitation service for product details between buyers and sellers (B2B) at SME level. They initially targeted the toy industry but they wanted to become a portal for buyers and sellers for different market segments using the same basic technology and business



idea. Currently, the company only has 10 key clients. System implantation and business development are not deemed as important as generating profits. In addition, the business depends on word-of-mouth for sales generation. It only focuses on project development and not marketing. No web-marketing exists although the company is aware of the benefits. As a result, the business continues to stagnate.

Clearly, web-marketing is a powerful weapon to promote businesses in a modern market environment, and this applies not only to service companies but also to manufacturing companies. For example, firm 3 and 11 are both long established engineering companies being very similar in respect of the fixed factors e.g. same service elements and high supply chain pressure.

Apart from product quality control and development, marketing is the area that firm 11 focused on the most. The company runs a wide range of web-marketing campaigns (online customer surveys, electronic brochures, regular emailing of customers, promotions on other websites, a variety of search engine promotions, ranking campaigns) as well as traditional marketing promotions. Successful web-marketing has secured brand awareness as well as attracting new customers all the time. The benefits of saving admin costs have been clear to see; a 10% increase on turnover since engaging in web-marketing activity.

Conversely, firm 3 deals with every job within the company manually without depending on any electronic system. Costs and product complexity are the key obstacles for the company to adopt e-b/c. The company does not have a marketing team. Marketing activities/web-marketing are both an irrelevant concept. 'Word-of-mouth' is the only way to generate business. This way of conducting business has never changed and the company itself has never expanded. If new competitors introduced themselves into this niche market, then the company will definitely be in a vulnerable position.

**(e) Importance of Customer Relationship Management (CRM)**

Good performance in customer relationship management directly impacts on the business success. Most of the larger companies have electronic customer management systems to improve customer service, and this helps to collect and analyse customers' information for better business performance.

Table 6.11 shows that small companies (firms 6, 1 and 8) can challenge large companies (firms 12, 13 and 14) by improving customer relations to the highest standard.

Case		service	product	supply	ICT	ICT	web		resource	customer	e-vision	internal		
Nb	age	size	orientation	nature	chain	skills	infrastructure	marketing	website	mgt	Mgt	strategy	coom	Total
2	0	1	0	0	4	3	3	2	0	1	1	2	1	13
7	0	0	4	4	0	4	3	2	1	0	2	1	2	15
4	0	0	4	4	0	4	3	3	1	1	2	3	2	19
3	3	2	2	0	4	2	1	0	1	1	2	0	1	8
10	4	1	0	0	4	2	0	1	1	1	2	1	1	9
5	2	1	1	3	4	4	3	1	3	2	2	3	2	20
9	3	2	1	2	3	2	1	3	1	2	2	2	2	15
11	3	4	2	3	4	4	2	4	1	1	3	3	2	20
6	1	1	4	4	0	3	3	4	3	1	4	4	2	24
1	3	1	4	4	1	3	3	4	3	1	4	3	2	23
12	1	4	2	4	3	4	4	4	1	4	4	4	4	29
13	3	4	4	4	0	4	4	4	4	4	4	4	4	32
8	4	1	3	3	4	4	4	4	4	4	4	4	4	32
14	4	4	3	4	2	4	4	4	4	4	4	4	4	32

**Table 6.11** Customer relationship management

The small firms which achieved the highest scores in customer management also achieved the highest scores in web-marketing and are ICT advanced.

For example, firm 6 is a small hotel, located far away from the city centre that employs 14 staff. In the highly competitive tourist sector, the business could struggle due to its inconvenient location. However, quick response to customers through their website, CRM system and other electronic systems are the most important success factors in their businesses. Customers can book online via 2 main linked external e-booking systems and also via the company's own website. Each of the systems has an electronic feedback facility which the company actively trawls for customers' suggestions and comments and they have also

adopted an in-house feedback system via departure cards. Such techniques have created a customer base which has 33% repeat business. All their electronic customer management systems, not only allow the company to collect customers' information and analyse their behaviour but also assists the company to divide the market segments and tailor business strategies to different customer groups. Overall, customer service has improved and a good reputation has been earned because of the level of customer service that the company provides.

#### (f) Importance of e-vision and e-strategies

It would bring failure if a firm does not have clear e-b/c vision and strategies. Table 6.12 shows the level of e-vision and strategy complementary to the level of business performance.

Case No	age	size	service orientation	product nature	supply chain	ICT skills	ICT infrastructure	web marketing	website	resource mgt	customer Mgt	e-vision strategy	internal coom.	Total
3	3	2	2	0	4	2	1	0	1	1	2	0	1	8
7	0	0	4	4	0	4	3	2	1	0	2	1	2	15
10	4	1	0	0	4	2	0	1	1	1	2	1	1	9
2	0	1	0	0	4	3	3	2	0	1	1	2	1	13
9	3	2	1	2	3	2	1	3	1	2	2	2	2	15
4	0	0	4	4	0	4	3	3	1	1	2	3	2	19
1	3	1	4	4	1	3	3	4	3	1	4	3	2	23
11	3	4	2	3	4	4	2	4	1	1	3	3	2	20
5	2	1	1	3	4	4	3	1	3	2	2	3	2	20
6	1	1	4	4	0	3	3	4	3	1	4	4	2	24
12	1	4	2	4	3	4	4	4	1	4	4	4	4	29
13	3	4	4	4	0	4	4	4	4	4	4	4	4	32
8	4	1	3	3	4	4	4	4	4	4	4	4	4	32
14	4	4	3	4	2	4	4	4	4	4	4	4	4	32

**Table 6.12:** Importance of e-vision and goals

Apart from firm 3 which does not have any e-vision or goal, there are three clear clusters as follows:

Cluster 1: Awareness level

Cluster 2: Visionary level

Cluster 3: Strategic level

Cluster 1 (firms 7, 10, 2 and 9) are aware of the benefits of e-b/c but do not have clear vision in terms of using e-b/c as a part of their business strategies.

Cluster 2 (firms 4, 1, 11 and 5) have clear e-b/c vision with some actions to assist the business but have not yet to implement any e-b/c system in place.

Cluster 3 (firms 6, 12,13, 8 and 14) have intensively devoted themselves to e-b/c based on their business needs and led by correct e-vision, specific goals and a set of e-strategies.

Table 6.12 clearly shows that a firm with a higher score of e-vision and e-strategies also has a higher total score, which demonstrates e-b/c vision and strategy that has significant impact on the overall business performance and success.

### (g) Importance of internal communication

Communication is absolutely vital to the success of a business. Effective internal communication digests the business information speedily, accelerates the business process and enhances the effective external communication with suppliers and customers. Table 6.13 shows two extreme clusters as follows:

Case No	age	size	service orientation	product nature	supply chain	ICT skills	ICT infrastructure	web marketing	website	resource mgt	customer Mgt	e-vision strategy	internal coom.	Total
2	0	1	0	0	4	3	3	2	0	1	1	1	2	13
3	3	2	2	0	4	2	1	0	1	1	2	0	1	8
10	4	1	0	0	4	2	0	1	1	1	2	1	1	9
7	0	0	4	4	0	4	3	2	1	0	2	1	2	15
4	0	0	4	4	0	4	3	3	1	1	2	3	2	19
6	1	1	4	4	0	3	3	4	3	1	4	4	2	24
1	3	1	4	4	1	3	3	4	3	1	4	3	2	23
11	3	4	2	3	4	4	2	4	1	1	3	3	2	20
5	2	1	1	3	4	4	3	1	3	2	2	3	2	20
9	3	2	1	2	3	2	1	3	1	2	2	2	2	15
12	1	4	2	4	3	4	4	4	1	4	4	4	4	29
13	3	4	4	4	0	4	4	4	4	4	4	4	4	32
8	4	1	3	3	4	4	4	4	4	4	4	4	4	32
14	4	4	3	4	2	4	4	4	4	4	4	4	4	32

**Table 6.13** Importance of internal communication

Cluster 1 (firms 2, 3 and 10): there are the low-tech manufacturing companies which are involved in complex products with high supply chain pressure. These companies mainly use email to communicate internally

and the overall business performances are the worst among all case study companies.

Cluster 2 (firms 12, 13, 8 and 14): most of these are large, mature companies from various sectors with different supply chain pressures and are normally involved in less complex products. All of them use a wide range of communication tools including emails, website, Intranet/Extranet and use of laptop/PDA and other wireless devices to enable remote working. In particular, firm 12 uses video-conferencing as a tool for employees from different offices to communicate. This helps the firm save a considerable amount of traveling expenditure. All managing directors from these companies said that “effective internal communication is beneficial to their businesses in all aspects”. All of their staff are able to share business information speedily and remotely; better communication, better the e-b/c performance overall.

#### (h) e-Resource management system impact on e-b/c integration

The e-resource management becomes the core concern of the operational efficiency where it is ignored by most small firms (7, 2, 4, 6 and 1) as shown in Table 6.14.

Case No	age	size	service orientation	product nature	supply chain	ICT skills	ICT infrastructure	web marketing	website	resource mgt	customer Mgt	e-vision strategy	internal coom.	Total
7	0	0	4	4	0	4	3	2	1	0	2	1	2	15
2	0	1	0	0	4	3	3	2	0	1	1	2	1	13
4	0	0	4	4	0	4	3	3	1	1	2	3	2	19
6	1	1	4	4	0	3	3	4	3	1	4	4	2	24
1	3	1	4	4	1	3	3	4	3	1	4	3	2	23
3	3	2	2	0	4	2	1	0	1	1	2	0	1	8
11	3	4	2	3	4	4	2	4	1	1	3	3	2	20
10	4	1	0	0	4	2	0	1	1	1	2	1	1	9
5	2	1	1	3	4	4	3	1	3	2	2	3	2	20
9	3	2	1	2	3	2	1	3	1	2	2	2	2	15
12	1	4	2	4	3	4	4	4	1	4	4	4	4	29
13	3	4	4	4	0	4	4	4	4	4	4	4	4	32
8	4	1	3	3	4	4	4	4	4	4	4	4	4	32
14	4	4	3	4	2	4	4	4	4	4	4	4	4	32

**Table 6.14** Insignificant impact of resource management

Those firms claimed that “purchasing and stock control are not relevant to the business and less important in service companies”. E-resource management is needed in manufacturing companies rather than other

sectors, mainly because most of them would like to improve efficiency and integration, but service firms are more willing to improve sales and marketing first. In reality, most studied manufacturing firms manage their resources manually because the firms lack e-b/c capability such as firm 2, 3 and 10. Firm 9 is fully aware of the benefits of e-resource management but it does not have the expected system in place due to the same reason. Thus, the firm uses stand-alone electronic package/systems in resources management to help internal efficiency.

Small firms are unlikely to adopt or develop e-activities in resource management because their business priorities might be limited to marketing, sales and customer service areas. Lack of e-capacities is another common reason for SMEs failure to adopt or develop e-activities in resource management.

Table 6.14 also shows the firms with the highest scores in resource management achieved the highest scores in other areas, and obtained the highest total scores in overall e-b/c performance regardless of the service orientation and size. Having an e-resource management system would simplify the whole business process and improve internal efficiency in many ways. The case studied firms prove that an electronic resource management system implies the success of e-b/c integration. In reality, it seems e-resource management may not necessarily be needed at the beginning of e-b/c development, it may be seen to be less important in small service orientated firms. Conversely, resource management systems are critical to system integration which leads to e-b/c success.

## **6.7 Summary of analysis**

The 0-4 scoring factor framework does provide a crude measure of a firm's e-business position at the time of study. Using the fixed and variable factors to compare two or more firms helps to sharpen the

analysis of both firms; comparing between two or more clusters allows a contrast to become clearer, thereby aiding the explanation of it.

The scores for each firm against each factor are judged based on a notional scale through positioning of the firm, but working with them maximises the accuracy for judgement and the simplistic scoring system shows (a) where the firm's current overall e-b/c position, (b) significant strengths and (c) gaps or opportunities for improvement.

From the above analysis, some interesting high level conclusions can be drawn except the factors that (a) the sample of firms studied are mainly Merseyside based firms and therefore might not necessarily represent the same significant conclusions for firms across the UK, and (b) the measurement of a firms' performance is based on a set of factors in a subjective scoring system. Even so, the following findings are identified:

- Overall, large firms normally have appropriate ICT infrastructure or skills and knowledge to support intensive e-b/c activities. They are fully aware of the benefits of e-/c and are actively engaged in e-b/c development for business growth. Improving business control and efficiency as well as increasing sales is the key motivation for e-/c development. Investment in ICT has been shown to be cost effective. In most small firms, the lack of e-b/c capabilities leads to a low level of ICT activity. Most of them are comfortable to stay within the current size, increasing sales seems to be the only priority to them. Therefore, e-b/c applications are adopted and developed in a very affordable way in separate business areas where it is used to directly benefit sales. E-b/c integration certainly is not considered because it is seen as unnecessary in most SMEs. Cost effectiveness is the key concern of ICT investment which sometimes has been seen as a threat rather than a potential benefit to them.

- In large firms, an integrated system that links within the supply chain and resource management can be extremely important and vital to the internal efficiency. Manufacturing companies are normally under higher supply chain pressure than service orientated companies. They are likely to have logistics information connected to both suppliers and customers which need to be managed properly for e-b/c success. However, the related e-activities (e.g. resource management) are often ignored by most of the SMEs. In those companies, suppliers and purchasers are managed manually which depends on key staff knowledge rather than any electronic systems. A firms' whole business process then becomes slow and inflexible.
  
- The nature of the products determines the adoption and the levels of integration in a firm in terms of using and implementing e-b/c. If the products have less or no product complexity (easy to be understood and chosen by customers), for example, CDs, books, tickets, online trading is clearly a beneficial way to enhance the sales channels and increase the revenue. Firms that have complex products (complex product design, difficult to choose by customers, normally require personal or expert advice to assist the buying process), would not take e-b/c as an effective option to the business success. As with complexity, having an electronic system does not necessarily simplify the business process/activity, but sharing the information with suppliers and/or customers does create that e-business dimension. Although the products might not be necessarily suitable for online trading they can still be effectively promoted through some e-activities in areas like marketing and customer service.
  
- Companies with high service elements attached normally have less supply chain pressure. In particular, those with strong customer orientation are likely to have advanced systems in web-marketing and e-customer management, which enable them to



compete with the large competitors. Companies with less service elements attached normally have high supply chain pressure with complex product process/requirements, which perform less well in e-b/c than service orientated firms. Most of those firms are far behind service firms in terms of the e-b/c up taken and the website usage. The rest of the firms focus on and are highly involved in web-marketing and e-customer service. This has a positive impact on overall e-b/c performance and is more likely to be successful despite other disadvantages.

- Micro firms (employ less than nine staff) established less than three years are disadvantaged in evolving e-b/c. Although the e-b/c can be seen as a strategic tool in the business development, most of them lack e-capabilities to get involved properly. This is because e-b/c is not a priority in most traditional companies at the early trading period of their businesses.
- Adopting and implementing e-business is not merely driven by the age, size, sectors or any supplier chain pressure. The e-b/c activities are mainly driven by the firm leader's vision and strategies of e-business, and influenced by the pressure from customers or suppliers. Owners' attitudes towards e-b/c are extremely different which directly impact on the outcomes of development and success. E-vision and strategy in each firm is dissimilar which drives the firm in different directions. Only firms with a positive attitude towards e-b/c can be helped further. Lack of e-business vision and strategies prevent coherent e-business development and success.
- ICT capabilities including ICT infrastructure, skills and website, are the fundamental reasons for the e-b/c success or failure. It must be managed by business needs and driven by e-b/c strategies but not merely the technology. Firms must be fully equipped before any commitment or plan of e-b/c.

Some studied firms achieved higher scores in all those critical/variable factors which are the most successful firms in e-b/c overall. The varieties of the factors are those in which the firms have set their position intentionally and which could be changed in the short term by the firm directly. The result leads to improved business performance and growth. Other factors (age, size, service orientation, product nature and supply chain) which can be considered in the short term as being outside the scope of the firm to change, also have significant impact on e-b/c success in SMEs.

The above case studies have shown that system integration is the ultimate goal of e-b/c success but not necessarily for SMEs and small firms in particular. Some firms, especially small firms might not need a fully integrated e-b/c system because of the nature of their businesses. Although the level of e-business integration varies in each unique case, the e-b/c adoption and development is needed and focused business areas equally give SMEs the power to improve business performance and competitiveness for success without the highly integrated system. The e-b/c capabilities and other influential factors are critical which enable e-b/c development in separate business areas as the first step towards system integration and e-b/c success.

Understanding firms' different approaches to e-b/c is the core of the case studies. There is not an unchanged systematic implement module/approach towards the success of e-b/c adoption and development through the case studies. However, a range of same critical success factors were identified in a scoring system which can help companies to raise e-business awareness and also help them to identify the potential and viability of e-business adoption and development.

## **CHAPTER 7      SELF-ASSESSMENT      TOOL      DEVELOPMENT, DEMONSTRATION AND ANALYSIS**

### **7.1      Initial proposal of e-b/c self-assessment framework**

After analysing the questionnaire data and conducting 14 case studies, the next logical step is to propose an easy to apply e-business/e-commerce self-assessment framework to raise awareness and improve performance in SMEs. In developing the framework, both theoretical and practical research was of vital importance. Practical research was undertaken within a community of SMEs who were willing to share good ICT practice and engage in a learning and collaborative partnership. This chapter commences by highlighting the benefits and limitations of a self-assessment tool and discusses the elements and concepts of the proposed framework based on key findings from the research project.

#### **7.1.1      Benefits and rationale**

The literature review undertaken has shown that a significant part of SME research conducted was not as rigorous as it could be, because the SMEs approached were not 'well known' and the number of case studies was relatively low. This research identifies a range of critical factors which have significant impact on the success of e-b/c development and it also links outcomes into a generic framework which is possible to assist with SME growth through e-b/c.

Gadd (1995) states that there have been numerous benefits gained from the use of self-assessment and it has provided the potential for many others. In general, the benefits gained fall into four categories:

- (1) business results
- (2) culture
- (3) process management

(4) benchmarking

Assessment of the data elements required the demonstration of both results and trends, at least in terms of:

- the organisation's actual performance
- the organisation's targets

Consequently the assessment is based on two levels, the degree of excellence of the results and the scope of the results.

Chapter 2 reviewed both benefits and limitations of the validity of self-assessment tools' in general terms. Although each self-assessment method has its own dimension and scope, the purpose remained to attempt to translate a different degree of e-business/e-commerce measurement into a practical means of improving e-b/c performance driven by a set of critical success factors through a benchmark scoring system.

Cassel et al. (2001) comments on benchmarking as a highly effective tool for companies who use it successfully. However thirty seven percent of companies that had never used benchmarking data were not convinced. Certainly, there is a need and scope to develop a benchmarking approach that is strategic, cost-effective and trouble-free for small firms. This approach should build on existing knowledge and findings from research into generic business practice and performance benchmarking which should also be based on emerging empirical research that indicates a more balanced view of benchmarking e-b/c.

Self-assessment as a tool/framework of benchmarking is commonly used in large companies. A number of benchmarking and self-assessment tools for improving business performance are explored (EFQM, 2002; Baldrige, 2002;

DTI, 2000b; Cragg, 2002; Gadd, 1995; Bui, 2003; Barclay and Porter, 2005), but only a few exist for e-business remedies. These e-b/c self-assessment tools are developed by large consulting firms (e.g. PriceWaterHouseCoopers, Oracle) and are extremely complicated and less relevant to SMEs. E-b/c self-assessment tools particularly for SMEs are surprisingly under-developed. Most practitioner approaches focus on metrics to assess technology maturity. Recent empirical research studies (Cragg, 2002; Caldeira and Ward, 2003) suggest that there should be greater emphasis on managerial competences, managerial involvement and development of ICT knowledge and skills which may be indicative of high performing firms linked to effective usage of ICT. Benchmarking within innovation, agility, and knowledge management can be problematic in SMEs who do not have large budgets or the time to invest in these types of management practice.

Yasin (2002) concludes that despite the increasing scope of benchmarking activities and the number of organizational users, the field of benchmarking has no distinctive theory to guide its advancement. Additionally researchers in the field of benchmarking are faced with the continuous need to develop innovative methodologies to guide benchmarking practices in emerging technologies such as e-commerce and supply chain management.

Benchmarking helps companies to raise performance to an accepted level in order to become more competitive. An organisation should tailor its benchmarking effort to its own broad improvement goal (McGaughey, 2002). However McGaughey also suggests that performance in critical areas must be measured; quantitative methods are preferred for measurement and best practice can be used to establish benchmarks.

The author believes it is possible to remove certain elements from Bui's (2003) and Barclay and Porter's (2005) for a potential e-b/c self-assessment tool/framework. This is as follows:

- a) Dimensions/categories need to be identified (based on key factors or main areas of the business);
- b) Each dimension/category is divided into sub directions in different levels on a continuous scale (criteria or statements of best practice from leading e-b/c SMEs);
- c) Firms are assessed against the highest level within each dimension/category;
- d) Must be systematic (a scoring system).

A synthesis of this work enables the development of a framework that could be used as a robust working model to develop a benchmarking ICT workbook suitable for small firms. This would emphasise critical success factors and create or enhance competences to adopt and develop e-business effectively leading to greater e-capability and improved company performance.

Based on the common elements of self-assessment tools/framework, factors were identified (discussed in Chapter 6) which informed some form of measurable framework such as a “likert” scale. It was designed to assess firms’ e-b/c performance against a set of critical success factors (particularly the variable factors), identify their weaknesses and recognise any improvements required. The framework helped the author to analyse a wide range of e-business activities within the studied firms (as discussed in Chapter 7).

The likert scoring factor framework provides a crude measure of a firm’s e-business position at the time of study. By using the fixed and variable factors to compare two or more firms, it helps to sharpen the analysis of both firms. Comparing between two or more clusters allows the contrast to become clearer.

The self-assessment framework is based on a generic model but tailored by the subjective opinion of the respondent. The scores each firm awards itself against each variable factor are based on a notional scale through positioning of the firm. From the outcome of a self-assessment process, the total scores of all critical success factors help a firm to identify the following:

- a) an overall current e-b/c position/level
- b) a firm's significant strengths and weaknesses
- c) gaps or opportunities for improvement.

Referencing back to the fixed factors gives an indication of the possible desirable effects that changes might bring.

However, it has also been recognised by SMEs as a guiding tool for self-awareness and decision-making.

### **7.1.2 The core elements**

Ng (2005) states that influencing factors can help to provide a framework to business organisations and assist them to make decisions on the selection of the most appropriate e-business model. The framework is designed to enable managers to consider and examine the relevance of these guidelines and criteria, and determine the essential factors that require consideration during their selection processes. The guidelines can also assist managers in determining to determine the level of resources, technological infrastructure and knowledge and the understanding of e-business models that are required.

The critical success factors are the processes central to e-business capabilities, impacting primary e-business activities which enable companies to obtain a better than average degree of business success through achieving the highest level of e-activities based on business priorities.

These factors are:

- ICT Knowledge/Skills
- ICT Infrastructure
- Web-Marketing
- Website
- Resource Management
- Response to Customer
- E-b/c Vision and Strategies
- Internal Communication

Firms are assessed for each factor and scores ranging from 0 to 4 are given according to different degrees of activities that relate to the e-business concept. “Zero” indicates that a firm remains traditional in their way of doing business for that area, a higher score indicates more advanced e-activities or applications involved for that area. A score of “four” is awarded for the highest level of e-activities within the area (e.g. a stand-alone system that can operate electronically or be ready for integration with systems from other business areas). Based on the practical work conducted, it suggests that large and e-business best practice companies achieve the highest score for each critical factor. Generally, these companies possess a sophisticated, highly integrated e-business system indicating that integration is an ultimate solution and a final stage for SMEs. The process between where they are and how to improve depends on the nature of the business and their e-capabilities. Each critical factor represents a focus within each important business area. SMEs can improve e-business performance from prioritised business areas to all other areas, according to their specific business needs. E-activities are classified into different levels within each business area and this provides a view of their current business activities and capabilities. In addition, it indicates where they should focus their attention in order to



achieve a higher level of e-activity or best practice. The self-assessment framework is designed with a flexible and pragmatic approach in mind.

### 7.1.3 A proposed e-b/c self-assessment framework

An overall proposed e-business/e-commerce self-assessment framework as follows:

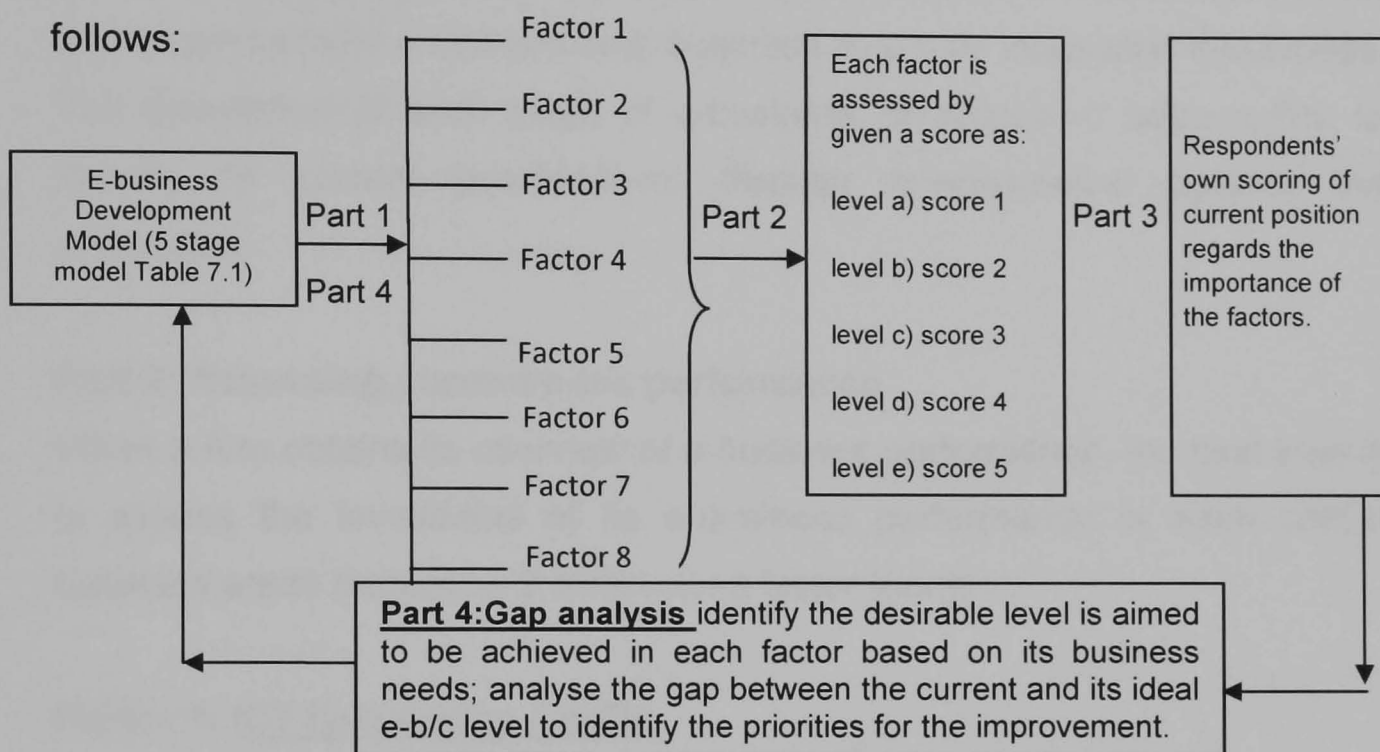


Figure 7.1: E-b/c self-assessment framework

Start Stage	Entry Stage	Presence Stage	E-Commerce Stage	E-Business Stage
Little/no ICT use, skills and expertise; limited or no knowledge and awareness of e-b/c	Starting to adopt e-b/c; only possess basic ICT skills and infrastructure; some knowledge and awareness of e-b/c but without clear e-b/c vision.	Possess better ICT skills and infrastructure, evidence of email and website usage (only for publishing information).	Possess in-house ICT expertise, functional website; evidence of using stand-alone e-b/ application e.g. web-marketing, online trading, e-customer service and etc.	Possess excellent levels of ICT knowledge/skills and advanced level of ICT infrastructure; evidence of integrated system usage, e.g. linked CRM system, integrated supply chain and etc.

Table 7.1 5 Stage e-b/c integration model

**The framework is divided into 4 parts and this is as follows:**

**Part 1: Assessing the level of integration**

Before developing e-b/c performance, a firm must be aware of the stages of e-business development. The 5 stage model clearly demonstrates the levels and progress from a conventional business to a fully integrated e-business. The description of each stage of e-business development helps a firm to identify its current position/level through benchmarking against the integration.

**Part 2: Assessing current e-b/c performance**

When a firm obtains its overview of e-business performance, the next step is to assess the level/detail of its e-business performance in each critical business areas through a '8 dimensions factor model':

**Factor 1: ICT Knowledge / Skills**

- a) **None** (company does not possess any relevant ICT knowledge and skills)
- b) **Basic** (company has basic ICT knowledge and skills but limited or no knowledge and awareness of e-b/c)
- c) **Ad-hoc** (company has some ICT knowledge and skills; call for support on an ad-hoc basis when encounter ICT problems)
- d) **Outsourcing** (company has contracted external support who deal with ICT issues)
- e) **Knowledge / skills intensive** (company has in-house ICT expertise)

**FACTOR 2: ICT INFRASTRUCTURE**

- a) **No integration** (company has stand-alone PCs and no internet connection)

- b) **Basic connection** (company has basic PC connectivity, typified by file sharing)
- c) **Basic integration** (company has its own simple internal network server, typified by LAN: local area network)
- d) **High integration** (company has an integrated system supporting key business activities online, typified by CRM or other business systems)
- e) **Full integration** (company has an integrated system that supports all business activities automatically and electronically, typified by ERP and other fully integrated business systems)

**FACTOR 3: WEB-MARKETING**

- a) **No marketing** (do not participate in marketing activities of any kind)
- b) **Traditional marketing** (promoting products/services mainly through television, radio, newspaper, seminars, exhibitions and other PR activities)
- c) **Email promotion** (promoting products/services to customers or trading partners mainly through regular emails)
- d) **Website promotion** (displaying contact information, publishing / promoting products/services mainly through website)
- e) **Marketing on the web** (running a wide range of online-marketing campaigns such as 'pay-per-click', search engine promotion, banner exchange, online-discussion and virtual communities)

**Factor 4: Website**

- a) **No website** (do not possess a company website)
- b) **Website presence** (publishing up to date company's products, services and contact information)
- c) **Online ordering** (accepting customer orders or modification of existing orders online)

- d) **Online purchasing** (facilitating customer purchase online including transaction processing)
- e) **Integrated system** (company system links suppliers' systems or internal operational system automatically)

**Factor 5: Resource Management**

- a) **No regular record** (company does not regularly review demand and resource balance)
- b) **Manual** (company manage resources manually)
- c) **Systematic** (company uses stand-alone systems to manage resources)
- d) **Electronic** (company uses simple integrated e-technology or software to manage resources)
- e) **Integrated system** (company possess a business system that links all resource information, analyses the capacity and cost, and shares relevant information with all parties involved)

**Factor 6: Customer Management**

- a) **Letter / mail** (customer enquiries typically answered by letter/mail)
- b) **Phone / fax** (customer enquiries typically answered by phone/fax during opening hours)
- c) **Email** (customer enquiries typically answered by email within and out of regular office hours)
- d) **Website** (customer enquiries typically answered by company website at anytime)
- e) **E-b/c system** (customer enquiries typically answered in real time, via e-b/c system)

**Factor 7: e-Vision and Strategy**

- a) **No commitment** (company has no strategic intention, awareness or plans of e-b/c)
- b) **commitment** (company is willing to explore the benefits of e-b/c but do not possess any goals and plans)
- c) **Vision** (company is currently not involved in e-b/c activities but have an intended plan to do so within the near future)
- d) **Priority** (company is using e-b/c to improve prioritised business areas according to an adopted plan)
- e) **Continuous improvement** (company executes e-b/c activities according to an embedded plan)

**Factor 8: Internal Communication**

- a) **Basic** (all staff within the company communicate via non-electronic means)
- b) **Emails** (staff communication mainly via the use of email)
- c) **Mobile working** (certain staff are permitted to access company systems from other geographic locations via various integrated electronic means)
- d) **Intranet** (all staff are able to communicate and exchange / sharing information through the company intranet)
- e) **Extranet** (all staff can locate and access information via the company extranet – staff only permitted website)

Each chosen statement is awarded a score (a: score 1, b: score 2, c: score 3, d: score 4 and e: score 5).

**Part 3: Identifying the importance of the factors**

Although all eight critical areas are extremely important for a firm's e-b/c development, what is important for one firm might not apply to another. Therefore, it is essential to identify the importance of the factors to a firm through its own ranking scoring based on their current position and business needs.

**Part 4: Gap analysis and identifying e-b/c priorities**

After identifying the most important (ranking) and scoring (weighting) the factors, the next step is to identify the desirable level it aims to achieve in each factor based on its business needs. The firm then can analyse the gap between the current and its ideal e-b/c level in order to identify the priorities for future improvement.

**7.2 Development of practical application**

The second part of this Chapter demonstrates the development of the e-b/c self-assessment tool. The initial proposed framework was shown to a focus group of 3 companies for feedback on the conversion of the framework to a practical tool. This section illustrates the development of the e-b/c self-assessment tool and the practical use of the final version of the proposed tool by applying it to 3 other pilot companies. The results of the e-business assessment in the pilot companies and their feedback are also discussed and summarised in this section.

**7.2.1 Focus group**

The initial proposed self-assessment framework was taken to three different companies for feedback and advice to develop it further as a tool. The companies involved are China Link (a global service company), United Automation (a well established manufacturing company), and Sandstone

Brewery (a newly established brewery). The framework provided a roadmap for steps to be undertaken in each critical area.

Weaknesses of the framework were also identified by the companies. These are as follows:

- Without a specific tool, the framework is very difficult to follow without face to face consultation.
- Identifying the current e-b/c state and possible future development of the company may present itself to be a statement rather than a practical assessment tool. Only a generic framework gives an indication of development which is more likely to be useful to business advisors than to the company itself.
- The gap analysis needs to be free from the researcher's bias.

The focus group suggested the following:

- The e-b/c self-assessment tool must be easy to understand, to follow and to use. Therefore, the tool must be precise and no more than two pages.
- The first part (assessing current e-b/c performance of the e-b/c assessment should be developed into a 'questions and answers' format with a clear scoring system.
- A five level continuous scoring pattern in each critical area was recommended, i.e. a scoring system of '1' to '5' instead of '0' to '4'.
- Guidance to identify their own priorities, based on the importance of each factor and the needs of future development in the specific areas.

Based on the results of the feedback and advice from the focus group and the study supervisory team, the researcher then converted the proposed framework into a practical tool (Appendix 7.1) which is divided into two key parts as follows:

**Part 1: E-business/e-commerce self-assessment**

There are 8 questions designed to identify eight different areas/factors of a firm's e-b/c performance. There are five answers/statements to each question that present the different levels of e-b/c performance in the particular areas/factors. A firm's owner/manager has to choose one answer only to each question in order to identify the level of the current performance in that particular area.

**Part 2: Benchmarking and priority analysis**

There is a 5 level spider diagram, and each dimension represents a critical e-b/c factor. The highest level (level 5) indicates an integrated e-b/c system formed by 8 critical success factors. A firm's owner/manager has to draw two separate diagrams-one is to present the firm's current e-b/c performance and the other is to present the aimed desirable future e-b/c position. The exercise enables the firm to benchmark its current performance against the system integration and its targeted future position. The benchmarking analysis not only helps a firm to identify the strengths and weaknesses of its current e-b/c performance but also enables the firm to carry out a gap analysis with a analysis, which identifies steps needed to be taken in order to achieve targeted position.

Then a firm has to rank the importance of each factor based on its own position and perceptions and also has to identify the gap between the current level and targeted level of each factor in order to analyse the priorities for the future improvement/development. The priority analysis is based on the gap analysis and a firm's own needs of its future e-b/c development.

The assessment tool was then sent back to the companies for their e-business self-evaluation. The results were then collected and attached as



Appendix 7.2 to 7.4. All of the firms confirmed that the converted tool was very straight forward, concise and easy to apply. It helped all of the firms to identify their strengths and weaknesses in terms of e-business performance. In addition, it also helped to identify the priorities for further development and enhanced the owners/directors' confidence to adopt or develop their e-business.

### **7.2.2 Pilot case studies**

The converted e-b/c self-assessment tool was then applied to three new pilot companies within the Merseyside region. A short interview (interview questions are attached in Appendix 7.5) was conducted after the self assessment. The company background, assessment results and feedback are reported in the following section:

Pilot companies 1 and 2 have no previous experience of e-b/c assessment or evaluation but pilot company 3 has undergone a prior e-business evaluation from a professional business advice agency.

#### **Pilot company 1: Try and Lilly Ltd**

##### **Company background**

A long established, specialist traditional manufacturer of headwear first named Alexander Legge at its formation in the 1860's. Richard Jennions bought Try & Lilly in 1958 by which time the company had expanded its product range. Today it is one of the UK's leading headwear producers specialising in military uniform caps, hats and other headwear for police, army, navy, air force and corporate uniform suppliers worldwide. In 1992, Try & Lilly attained BS5750 making it the first British hat manufacturer to reach this standard and has continued its quality improvements ever since. The company is now renowned for its high quality production abilities and strong brand image. Although it is a family business as most SMEs, it

employs approximately 60 people including machinists and office staff. The annual turnover is around £ 1.8 million.

Design is usually partly through negotiation with customers utilising the expertise and knowledge of the firm. A major shift in the last 6-12 months has been the transfer of the majority of production “offshore” and the emergence of a large new product portfolio. Around 80% by volume is now sourced outside the UK, in Poland, Czech Republic and Bulgaria. Some of this work is finished hats (the offshore manufacturer sources all components and makes and supplies the completed item). The majority of offshore production requires T&L to send cloth, components, plus diagrams and comprehensive instructions to the small manufacturers, and maintain very close contact during production. Language is said to be a significant problem requiring all communication to be expressed in very detailed, accurate wording. (Source: Interview with Director Tony Jennions and the company’s website [www.tryandlilly.co.uk](http://www.tryandlilly.co.uk))

### **Assessment results (Appendix 7.6)**

The company’s overall e-business activity is still at the top end of level 2 (Entry level). The company has started to adopt e-business, and currently possesses basic ICT skills and infrastructure. Some knowledge and awareness of e-business was identified but without clear vision or strategy of what to do next.

Website and internal communications were identified as the weaknesses of the company. Web-marketing and resource management were identified as the strengths because of the higher levels of e-activities compared with other areas. Its web-marketing and resource management systems are yet to be fully integrated and the company has expressed no further interest in any future development. Apart from web-marketing, the company is willing to

improve all critical areas to the next higher level but lack the knowledge and expertise to undertake the necessary tasks involved. Website and customer management were rated as the most important factors of all by the company's director. Based on the importance of each critical factor to a specific company area, its business needs and the gap between current performance and targeted level for future development, the top three priorities were identified as 1) Website 2) Customer Management and 3) Internal Communication. The director was then advised to revisit the first part of the e-business assessment to explore the pathway for each identified priority.

### **Key feedback**

The director is extremely keen on improving their e-business performance. He had intended on changing the systems two years ago but lacked a clear vision of what exactly was required and it subsequently proved difficult to influence all managers and staff to share his vision on change without any evidence or strategic plan. By undertaking the self assessment, it has helped him to obtain a clearer picture for future development. In general, the tool was positively received, being easy to understand and to use. The director complained that there was no easy to apply e-business tool for SMEs and had no intention of answering pages and pages of questions (no more than two pages of questions). The results of the self assessment highlight the fact that the company has been stagnant in the last three years. On a more positive note, the director is pleased that the tool has reiterated specific areas of strength and intends to share the results of the assessment with his staff with confidence. The director also intends to reuse the tool in other departments so that he can gain a better understanding of their current e-business capabilities. With the assessment results to hand, he wants other departmental managers to share his vision on e-business performance and strategy for further development. The assessment results will help to

derive an action plan to implement subsequent e-business development. The director strongly believes that the self-assessment tool will help to support his decision making and to get his staff on board to share in his vision on the importance of e-business to the company as a whole.

### **Pilot company 2: Mersey Maritime Ltd.**

#### **Company background**

Mersey Maritime Ltd. is a unique business that has been newly created by the maritime industry on Merseyside to enable the region to consolidate on its successful past and build for a sustainable future. It is a part of Mersey Maritime Group along with Maritime and Engineering College North West. Mersey Maritime Ltd. represents a Maritime 'cluster' of more than 1,000 businesses, employing 26,000 people with a turnover of £2.5 billion per annum. The company currently employs five people and it exists to promote and develop excellence in all maritime related activities on Merseyside and to represent the interests of existing and new cluster members. The key services are:

- Proving business advice.
- Providing skills training and apprenticeships.
- Proving networking and collaboration opportunities.

Mersey Maritime has been formed through the commitment of its private and public sector partners across Merseyside with the shared vision to develop a world class cluster of maritime businesses.

The key objectives are as follows:

1. Grow tonnage, turnover and profitability.
2. Increase employment numbers.
3. Galvanise all 1,000 companies into a forward looking entity with highly skilled, motivated and customer focused staff.
4. Promote Mersey Maritime as modern growth business.

5. Make Mersey Maritime the destination for world class training facilities.
6. Communicate with all local communities on key issues.
7. Become the champion of Mersey Maritime business on a lobbying platform.
8. Fulfill and enhance its environmental duty.
9. Build up the region as a centre of excellence for logistics.
10. Make the Mersey Maritime Cluster the first successful one of its kind in the UK.

Source: Interview with the Project Manager Tim Sung

Source: <http://www.merseymaritime.co.uk>

#### **Assessment results (Appendix 7.7)**

The company's overall e-business activity is at level 3 (Presence level). The evidence of email and website usage was identified but only for publishing information.

Possessing in-house ICT expertise was identified as the strength of the company. Resource management and web-marketing were also identified as its strengths compared with other critical areas. Internal communications was identified as the poorest area. The company is very keen to improve all other critical areas to the next higher level. Customer management and e-vision and strategy were rated as the most important factors by its project manager followed by ICT infrastructure and resource management. Through the self assessment tool, the top three priorities were identified as 1) ICT Infrastructure 2) Website and Internal Communication and 3) Customer Management and e-Vision/Strategy. The manager was then advised to revisit the first part of the e-business assessment to explore the pathway for each identified priority.

### **Key feedback**

The manager believes that the single, biggest problem faced by the company is its fragmented internal communication between staff. Each division has its own vision and strategy of e-business development. The different divisions need to unite together to make essential change for growth. The manager believes the most important factor is to work to an agreed plan. The analysis highlights that ICT infrastructure is the first priority of all. It pushed the manager to reassess the issues faced by the company and he subsequently confirmed that ICT infrastructure was the main obstacle for preventing progress. He agreed that it required urgent improvement in order to support other critical areas. If staff began to communicate more effectively, they are more likely to come together to share the same vision. It also enables management to plan a more effective strategy. The manager believes the self assessment tool proved to be very effective and useful, assisting him to derive a clear action plan. Following the assessment, he feels more confident on communicating his vision and ideas to different business divisions. He also intends to repeat the assessment in different divisions in order to formulate a unified strategic approach to take the company forward.

### **Pilot company 3: R Baker (Electrical) Ltd.**

#### **Company background**

The company was founded by Robert Baker in 1982, R Baker (Electrical) Ltd. has enjoyed substantial growth ever since. In 1990, the company expanded into its own purpose built premises in Liverpool, a site which allows great scope in manufacturing an extensive range of electrical equipment for clients with highly contrasting needs. Currently, the company employs 23 people with turnover approximately £1.4m.

R Baker Electrical Ltd. provides high quality products and solution-led electrical and mechanical services. The services are utilised across a wide range of industrial applications in military, marine/offshore, glass, rail and other sectors.

The company provides affordable, flexible and purpose designed business solutions and products to its customers based on the understanding of the customer needs. Through regular investment in new technologies and a rigorous 24 hour on demand service, the company maintains an outstanding level of reliability and quality to every market sector they work with.

Source: Interview with the owner Robert Baker

Source: <http://www.rbaker.co.uk/>

#### **Assessment results (Appendix 7.8)**

R Baker Electrical Ltd. has a very confident owner and a well developed e-business system considering the size of the company. The company's current overall e-business activity is at level 4 (e-Commerce level). A functional website and evidence of using stand alone e-business applications, for example, e-marketing, online trading and e-customer service were identified. Sophisticated ICT infrastructure was identified as a huge advantage to support its e-business development. International communication, customer management and resource management were identified as strengths, all of which achieved the highest level within its area. The poorest area is e-business vision and strategy. Customer management and internal communication were rated as the most important critical factors and the highest levels were achieved for these areas. ICT knowledge/skills, website, vision and strategy were identified as the priorities for the company's future e-business development. The owner is clearly aware of the priorities and hopes to improve and progress onto the next level. He

also believes that the level of web-marketing is just at the right level for the business and requires no further progress.

### **Key feedback**

The results from the self-assessment are very similar compared with the previous evaluation from a professional body. The results confirm the overall strategy and direction of future development. Although being a visionary leader, the owner initially placed little importance on identifying priorities. After the assessment, the owner praised the effectiveness of the self-assessment tool. He believes the tool will assist him to make clearer business decisions. He emphasised that small firms are different from large companies in numerous ways. A significant difference is that most small business owners/directors need to take care of almost everything within their business. There are always operational issues that require attention, rather than solely focusing on business strategy. The priority for most small businesses is about how to sell more to their customers. They often undertake as many responsibilities as they can and have to juggle between numerous daily tasks. Therefore most business owners/directors have little time to derive a detailed e-business plan regardless of their e-business awareness. The company owner/director also stressed that it is extremely difficult to identify an e-business strategy with limited capacity, time and resource. Having an external assessment and evaluation of its e-business helped the company to grow at a strategic level. However, the previous e-business evaluation was time consuming and costly and little has improved since then. The only negative feedback on the assessment tool was that it did not provide the information required to progress onto the next level within each critical area.



### 7.2.3 Summary

The use of the proposed e-b/c self assessment tool in all pilot companies has drawn positive feedback from those involved which is summarised as follows:

- The e-b/c assessment tool is very easy to understand and to use.
- The tool helps to identify a firm's e-business performance, its strengths and weaknesses successfully.
- The tool helps firms to identify its priorities for e-b/c improvement/development.
- The tool helps to unify different departments in a firm in order to share the same vision/strategy for future development.
- SME owners/managers feel more confident to plan for further e-b/c development after using the tool.

The companies welcomed a tool specifically designed for SME and commented on its effectiveness to derive an understanding of current e-business capabilities and to assist future e-business development. To the author, the feedback also suggests that the assessment tool is likely to be more useful to SMEs who have not undergone previous e-b/c evaluation. The only negative feedback leads to the future work which will be discussed in Chapter 10.

## CHAPTER 8 ANALYSIS AND DISCUSSIONS

### 8.1 Discussion of key research findings

“E-business/e-commerce” is a relatively new and innovative concept to SMEs. The research work conducted involved both theoretical (literature review) and practical research work. Practical research involved an initial investigation with pilot firms, questionnaire research to targeted firms and semi-structured interviews with key company personnel from the targeted firms.

In the literature review, a wide range of e-b/c specific areas of research interests were studied and discussed. Definitions of e-b/c, small firm characteristics and e-b/c benefits, barriers, e-b/c success factors, development models, strategies, best practice and current self-assessment tools were covered in the study. The key findings from the literature review are as follows:

- E-business or e-commerce adoption and development is highly desirable in SMEs because of the impact, benefits and opportunities identified through past research evidence.
- E-business system integration is the ultimate solution for e-b/c success.
- There are numerous barriers associated with e-b/c which leads to low level e-b/c involvement and development.
- E-b/c success is driven by business needs, influenced by a set of critical success factors, appropriate strategies and good practices; not necessarily through e-b/c system integration in SMEs.
- The conceptual model of e-b/c success is based on six dimensions (critical factors) of competence.
- ‘Step models’ were commonly used to guide firms from low level e-b/c involvement, gradually moving towards a fully integrated e-b/c system.

- A range of critical success factors were identified. This gives an insight into the possible support mechanisms required for e-b/c success in SMEs.
- Literature suggests e-b/c best practices should be used as a benchmark for e-b/c success.
- A self-assessment tool as a form of benchmarking was identified as a constructive aid to improving business performance as well as increasing e-b/c awareness. Only a few e-b/c assessment tools were identified, but these were not specific to SMEs.

The key findings from the literature review validate the research purpose and expose the opportunities, challenges and arguments of this research. The outcome of these findings provide a foundation for an initial investigation of e-b/c in SMEs.

The initial investigation (pilot questionnaire, interviews and practical work) was carried out to obtain an overview on current e-b/c adoption and practice in Merseyside SMEs. It aimed to identify the motivation behind e-b/c adoption and development, current ICT capabilities and critical success factors in local companies. It also aimed to explore practical support and hindrance factors, current e-b/c activities and the most appropriate way to classify the SME sector.

The initial investigation helped the author identify a list of key barriers to e-b/c adoption and development in SMEs. The outcomes from the initial investigation also helped to draw an overview of current e-b/c status within Merseyside SMEs. These are summarised as follows:

- 30% of Merseyside companies are not willing to adopt any type of e-b/c activity. 70% of companies are willing to adopt or develop e-b/c towards a high level/stage (e-commerce stage or above). 91% of firms are either still involved in low level e-b/c activities or

nothing at all. Of all the companies surveyed, only one has a fully integrated system.

- Lack of e-b/c awareness, strategies, effective communication, ICT skills/expertise and infrastructure are the main reasons why 30% of the firms studied failed in e-b/c adoption and development.
- Benefits of having an integrated e-b/c system are not recognised in most firms; they believe the success of e-b/c is based on appropriate strategies which are driven by the needs of each individual business not necessarily through an integrated system.
- All of the firms believe that a website enhances their competitiveness but most of the companies surveyed had a website which was only used to publicise information. Only 10% of companies have sophisticated websites which supported a wide range of their e-b/c activities.
- 60% of companies recognise web-marketing as a competitive marketing tool, helping them achieve business success. Web-marketing and online trading are the most popular and highly demanded e-b/c applications. Advanced standalone systems such as CRM and ERP were only utilised by 5% of firms.
- Owners' attitudes towards e-b/c are extremely varied and possibly influential over e-b/c success or failure.
- Adopting and developing e-b/c in specific business areas e.g. marketing, sales, communication and customer service are the key priorities to most firms.
- 'Stage model' is identified as a useful tool that can help firms to understand the overview of their current e-b/c performance and to set targets for future e-b/c development. However, it does not assess firms' capabilities in detail and certainly does not provide a clear direction for further development.

- Each business is a unique case. Therefore, it is difficult to identify a generic e-b/c implementation model that is suitable for all businesses.

The outcomes from the initial investigation provided guidance and further information for the researcher to collect and classify SME characteristics; to identify business priorities and current status of e-b/c activities in SMEs; and to explore e-b/c activities in different areas of business and its levels in the next stage of research. A full questionnaire was designed to achieve the above objectives. The questionnaire aimed to assess e-b/c awareness and the reality of e-b/c good practice; to identify a range of important factors that might influence e-b/c best practices and the relationship between them. The key findings from the questionnaire analysis are summarised as follows:

- There are significant identifiable differences between small and larger firms but less significant differences between service and manufacturing firms.
- Currently, SMEs are less likely to have integrated or advanced e-b/c systems (especially in small firms). Low levels of e-b/c awareness and activities in most business areas are evident. SMEs do not perform as well as they think they should.
- Despite the low levels of e-b/c activities, most SMEs are willing to improve their business performance by using e-b/c application(s) in one or several specific business areas. The highest level of e-b/c activities was found in resource management.
- Size and service elements have a degree of influence over e-b/c performance.
- A range of good e-b/c practices identified from the literature review are not always deemed appropriate for SMEs. Some widely regarded e-b/c good practices i.e. quick response to customers, clear e-b/c goals and vision, full e-b/c awareness, secure and reliable systems, e-b/c priorities and effective communication are

ranked as important practices by SMEs; other e-b/c good practices are ranked as not so important i.e. use of online training for staff development and online employees survey.

- A wide range of critical factors were identified, which were likely to impact upon e-b/c performance. Some critical factors were likely to have significant impact on e-b/c good practice and its awareness e.g. website, ICT skills/knowledge, ICT infrastructure, communication, web-marketing, online trading and electronic resource management.

The suggestions guided the researcher to study a variety of firms in order to observe the conduct of e-b/c activities in different business areas, to explore knowledge attained within these firms and to assess firms' e-b/c performance against a range of critical factors. Fourteen selected firms were interviewed. The key findings are summarised as follows:

- Only one small firm has a fully integrated e-b/c system. Developing an integrated e-b/c system is not an immediate, quick-win solution for SMEs in reality. Firms suggest that using appropriate strategies to improve business performance in specific areas is the key to e-b/c success. It must be driven by business needs, not the technology itself.
- There is no one single strategy that fits all e-business scenarios. The strategies need to be tailored for specific business circumstances.
- Overall, service orientated firms are more proactive towards e-b/c activities in marketing, sales and customer service, compared to manufacturing firms. In addition, it seems apparent that most service companies have a wide range of customers, whereas for manufacturing firms, most of them tend to form intense relationships with a few, key customers or suppliers.

- Business priorities are different between service and manufacturing firms; between large and small firms and new and mature firms.
- Web-marketing, online trading and Customer Relationship Management are the most popular e-b/c applications identified by firms as key success factors.
- E-b/c capabilities e.g. website, effective communication, ICT e.g. infrastructure and skills, e-b/c vision and strategies are identified as the most important factors for e-b/c success.
- Certain factors e.g. service elements, size, age, supply chain pressure, product complexity have been identified as difficult to change in the short term.

The key findings from the questionnaire analysis lead to the formation of semi-structured interviews. These interviews were then subsequently conducted with 14 different companies. The information and findings gathered from the semi-structured interviews were then converted into a series of case studies and also used to produce a crude measure of a firm's e-business position. This helped the researcher to assess a firm's level of e-b/c activity in each key business area and to analyse and compare e-b/c performance between two or more different firms. From the case study analysis, the key findings are summarised as follows:

- 1) There are significant differences between large and small firms in several areas and this is depicted in the following table (Table 7.1):

	<b>Large firms</b>	<b>Small firms</b>
<b>ICT infrastructure</b>	better equipped	less equipped
<b>ICT skills/knowledge</b>	advanced level	low level
<b>Motivation for development</b>	business growth and internal efficiency	sales
<b>E-activities</b>	advanced level in most business areas	low level
<b>A fully integrated system</b>	very likely	less likely
<b>E-b/c awareness &amp; vision</b>	full awareness with very clear vision	less aware
<b>Business priority</b>	system implementation and integration	marketing and sales

**Table 8.1** Differences between small and large firms

Overall, large firms are better e-b/c performers compared with small firms. Some of the differences noted are likely to impact on the overall business performance. For large firms, integration seems to be the only benchmarking tool to measure e-b/c success whereas for small firms, adopting specific e-b/c applications based on business priorities helps to improve overall business performance.

## 2) Impact of Fixed Factors to e-b/c success

- Overall, young firms are disadvantaged in e-b/c.
- There is significant difference in terms of e-b/c integration between small and large firms, but small firms can eventually overcome this by adopting and developing specific e-b/c applications in the required business areas.
- Firms that have complex products processes/requirements with high supply chain pressure and less service elements are normally poor e-b/c performers. Good e-b/c performers are usually service orientated firms with less supply chain pressure and little / no product complexity.
- A stand-alone supply chain factor might influence a firm's decision and activities in e-b/c but not the performance.

Fixed factors have some influence on e-b/c success especially in small firms and are difficult to change/improve in the short term. These fixed factors helped the researcher understand SME characteristics, behaviours and suitability of e-b/c development.

## 3) Impact of Variable Factors to e-b/c success

ICT capabilities (ICT skills and infrastructures), website, web-marketing, Customer Relationship Management systems (CRM), e-b/c vision and strategies, internal communication, Enterprise Resource Planning systems (ERP) are the most critical success factors which have significant impact on e-b/c performance. They are either directly linked into different areas of business or highly influential to e-b/c success.



Web-marketing can improve marketing performance immediately; having a sophisticated website helps to achieve online trading (both selling and purchasing online); a CRM system can help to improve customer service significantly; an ERP system can help resource management and the supply chain system integrate into a whole e-b/c system; advanced ICT capabilities with a sophisticated website are the solid foundation of e-b/c development; and e-b/c success cannot be achieved without effective internal communication and clear e-b/c vision and strategy.

The information and findings, in particular the 'variable factors' and 'fixed factors' data gathered from the case studies formed a scoring assessment which was then successfully applied to all case study companies. The assessment results were then analysed. At the time of study, it provided a crude measure of a firm's e-business position which demonstrated that a firm's e-business performance and the level of activity can be measured through a scoring system. Through the assessment, the author confirms that 'fixed factors' are only useful in terms of identifying a firm's character. The author also believes that encouraging a firm to improve its 'variable factors' is the best approach for e-business adoption and development. At the end of the study, the eight 'variable factors' developed into a 'conceptual factor model' which was then subsequently used as the basis of a proposed e-b/c self-assessment framework.

Based on key findings from both practical and theoretical research, the framework was devised and evaluated with three small companies. The evaluation results, together with feedback and advice from industry experts helped the author to convert the framework into a practical e-b/c assessment tool. The proposed tool was then applied and tested with three new pilot companies. All three companies gave positive and encouraging feedback from the evaluation. Some limitations of the tool were discovered and highlighted. The limitations of the tool lead into possible future work and this is further discussed in Chapter 10.

However, the progress and the development of the e-b/c self-assessment tool fulfil the key purpose of this research project.

## **8.2 Discussion of hypotheses**

The underlying research question is as follows:

“How can we help SME business growth by the adoption and development of e-business/e-commerce?”

The importance of e-business/e-commerce in the economy and the profound impact of this technological innovation has impacted business in an extraordinary way, and has changed the approach of business transactions and processes. Within the e-business/e-commerce phenomenon, SMEs are brought to the forefront for their significant economical and social contribution to GDP and employment. SME's are also the source for many new innovations and inventions. There are many advantages promised by e-business/e-commerce, and individuals and businesses should be further encouraged to embrace and adopt this new technological innovation. However, many researchers have found that e-b/c awareness is not a straightforward process. Therefore, helping SME business growth by the adoption and development of e-b/c is imperative and essential.

The research work aimed to stimulate and promote e-b/c awareness in SMEs; to encourage e-b/c adoption and development; to produce an easy to apply tool/framework for e-b/c development and implementation; and to advise and support SMEs in e-b/c in order to stimulate SME business growth.

The research work consisted of seven stages, divided in two phases. The research work starts from an initial exploration (literature review, questionnaire and interviews), the information gathered then applied to

practical research (questionnaire, semi-structured interviews, case studies and the development of the e-b/c self-assessment tool) for the next research phase. Conclusions are drawn as follows:

General Hypothesis:

*Regardless of a firm's size, age, service orientation, product complexity and supply chain pressure, it is possible that its e-business/e-commerce capabilities can be assessed in overall terms by the application of a model which in turn could form the basis of an improvement process/methodology.*

There are many existing e-b/c models that could be applied to help SMEs, but there have been few examples of successful application (Currie, 2004). Nevertheless, e-b/c stage/step models (DTI, 2002; Lynn and Matlay, 2002; Keeling et al., 2000; Clegg et al., 2005 and etc.) are widely and commonly used for e-b/c development. The stage model only promotes e-b/c integration which has its limitation as most SMEs, in reality, are not willing to have an integrated system. SMEs implement e-b/c solutions on piecemeal basis. Understanding a firm's character is important because the nature of the firm might determine the necessity of adopting and developing its e-business. However, the nature of a firm's character is not likely to be changed within a short period of time. It is more important to focus on helping SMEs to improve the critical factors/areas which might significantly impact on their e-b/c performance regardless of the complexity of SMEs' different characters. The research findings helped the author to produce a conceptual self-assessment model/framework for e-b/c development and implementation which uses the "conceptual factor model" consisting of 8 critical success factors, together with 'gap analysis' and 'priority analysis' in order to:

- a) increase e-b/c awareness and motivation
- b) assess current e-b/c performance and possible future development

- c) provide a possible vision of ideal future state and the gap between current situation
- d) identify the priorities for e-b/c development based on business needs

The self-assessment model/framework describes the process and methodology of e-b/c improvement which was proposed in the first part of Chapter 7. The e-b/c development follows the model rather than becoming a strategic exercise and the whole essence was captured and developed into an easy to apply e-b/c self-assessment tool. It was tested and applied in 6 SMEs. This innovative self-assessment tool answers the research question and fulfills the aims of the research project.

Other sub-hypotheses are drawn and discussed as follows:

*H a: There are likely to be significant identifiable differences between larger and smaller firms in terms of e-activities capabilities, motivation for development, integration and priorities for action.*

E-b/c development in large firms is mainly driven by internal efficiency and system integration. Large firms are fully aware of e-b/c benefits, they are likely to be better ICT equipped, have clear e-b/c visions, strategies and better ICT skills/knowledge. As a result, large firms are likely to have a fully integrated e-b/c system and advanced levels of e-activities in most business areas.

In contrast, e-b/c adoption and development in small firms is driven by generating sales and business promotion. Small firms are less aware of e-b/c benefits, visions and strategies; they are less well equipped in ICT and have low levels of ICT skills/knowledge and e-b/c activities. As a result, most small firms are less likely to possess a fully integrated e-b/c system. Table 5.1 and 5.4 illustrates the differences between small and medium firms, summarised results (Appendix 5.33) also show that there

are statistically significant mean differences between users and non users of websites, in-house ICT staff, ad-hoc and wireless in small firms (but not in medium firms). Table 7.1 demonstrates the differences between small and large firms.

*H b: SMEs are less likely to have integrated or advanced e-b/c systems. The SME's view of business growth success and its measurement may not necessarily be linked to the level of e-activity integration.*

Case study findings, especially from large firms, suggest that full integration is the ultimate solution for e-business success as many research papers state that integration with existing systems is viewed as an important aspect of e-commerce effectiveness. For micro firms (less than 10 employees) and less well equipped ICT firms, the overall level of e-activity is low and failure rate is significantly high. An integrated system leading to e-b/c success in large firms does not necessary mean it is the only or most effective approach for SMEs.

There are numerous barriers faced by SMEs which prevent them from achieving an advanced e-b/c system. Their overall e-b/c activities remain low at level 1 or 2 (see details in Table 5.3 and Appendix 5.19 in Chapter 5.3.2). The initial research illustrates that most SMEs lack ICT skills/knowledge and infrastructure; most SME websites are only used for publishing information and not for online trading; investment in ICT is less of a consideration; most SMEs are unaware of the benefits that e-b/c might bring and have no clear vision of e-b/c and its strategies. The initial research also shows that 91% of firms are at the low level of a-b/c activity (see details in Chapter 4.2). Small firms grow fast if they adopt and develop e-business application(s) within their core business areas as this significantly improves their competitiveness and chances of business

success. There was little or no evidence to suggest that integration took place within small firms.

Case study findings also demonstrate that an integrated e-b/c system is not necessarily required because of business needs, cost effectiveness and ICT capabilities. SMEs consider sales, marketing and customer service to be the most important business areas and are therefore willing to adopt and develop specific e-b/c applications to improve business performance. Most small service orientated firms believe it is unnecessary to use e-b/c applications in resource management and purchasing. Although literature suggests that system integration is the ultimate solution to e-business success, research findings illustrate that SMEs implement e-b/c solutions on a piecemeal basis not via integration. The adoption and development of an e-b/c system is driven by business priorities and needs, not the technology itself. However, what constitutes success is by no means easy to define. In some markets continued existence of a firm might be regarded as a success whilst in others, nothing less than high sales growth would be considered a success.

This suggests that a flexible and pragmatic e-business model is required as proposed which is based on the firms' needs and priorities, not through immediate system integration.

*H c: It may be possible to evaluate the level of e-activity in each main business area to reflect the level of systems integration, and also evaluate their e-b/c involvement and key actions for growth.*

A firm can be assessed via a 5 level stage model (stage 1: a traditional business to stage 5: a transformed e-business with fully integrated e-b/c systems). Specific e-activities/applications represent different levels of integration (see details in Chapter 2.9). The initial investigation, questionnaire research and case studies illustrate that SMEs are less likely to have an integrated or advanced e-b/c system regardless of how

important and critical it is to e-b/c success. Not every firm's e-b/c development advances to the highest stage, as most firms have business priorities and areas that they want to improve. Throughout the questionnaire research and semi-structured interviews, the researcher found that in reality SMEs prefer to adopt and develop e-b/c application(s) in one or several specific business area(s) in order to achieve business growth instead of pursuing an integrated e-b/c system. Different levels of e-b/c activities can exist in each business area. If a firm can achieve the highest level in all business areas, then there is a high degree of possibility that the firm has achieved an integrated e-b/c system.

*H d: It is possible to identify the factors that support/hinder e-b/c adoption and development in SMEs.*

Literature suggests that successful adoption and development of e-b/c can be achieved by developing a set of competencies relating to factors such as e-b/c strategy and vision, system and infrastructure, functionality of website, good customer service/care, effective communication and this is completely supported by the author. The initial investigation demonstrates that the key reasons for e-b/c failure are lack of ICT capabilities (ICT skills, knowledge, website and infrastructure), limited e-b/c vision and strategies and lack of financial support.

The results from the questionnaire analysis also illustrated some influential/critical factors (size, service orientation, e-b/c awareness, e-b/c vision and strategy, website, ICT infrastructure and skills/knowledge, communication, web-marketing, online trading and electronic resource management) which are likely to impact on the adoption and development of e-b/c (see details in Chapter 5.3.2 and 5.4). The results also demonstrated that users of websites, in-house ICT staff and web-marketing are better e-b/c performers than non users.

Web-marketing, online trading and Customer Relationship Management are the most popular e-b/c applications, all having been identified as success factors by the studied firms. E-b/c capabilities, e.g. website, effective communication ICT infrastructure and skills, e-b/c vision and strategies were identified as the most important factors for e-b/c success.

In conclusion, the factors identified throughout the whole research project are likely to influence the success or failure of e-b/c directly or indirectly. These factors can be classified into two categories: 'fixed factors' (Appendix 6.16) and critical success factors also known as 'variable factors' (Appendix 6.17). Fixed factors are often difficult to change or improve within the short term. Variable factors can be improved with sustained effort and support and are likely to support e-b/c adoption and development in SMEs.

*H e: The success of e-b/c most likely depends on a set of enabling factors that may potentially influence an SME's capability to adopt good/appropriate practice in e-activities. Such factors may be used as the basis of a simple self-assessment tool that an SME could use to improve its performance.*

The results from the research leads the author to believe that e-b/c success should be driven by appropriate strategies based on business needs rather than ICT revolution. It was proved that there is no single strategy applicable for all business needs or a particular e-b/c self-assessment tool for SMEs. The research shows that a list of e-b/c good practices can raise awareness but it does not suggest how to achieve that. In addition, some of the good practices suggested by literature are not popular in reality.

'E-b/c stage model' is only able to increase e-b/c awareness and encourages SMEs to develop a higher level of e-b/c system, it lacks



diversity as *Chaffey (2002)* claims that integration requires processes to be re-engineered which cannot be achieved immediately. 'Stage Model' also lacks sufficient detail and information; detail that is necessary for firms to utilise and improve on their current performance. Improvement must be based on business needs, not the technology itself but there is very little existing literature (*Fillis et al., 2003*) which focus on the e-business needs of a firm.

The research shows that a set of variable factors (e-b/c vision and strategy, website, web-marketing, customer management, resource management, ICT knowledge/skills, ICT infrastructure, internal communication) have significant influence/impact over e-b/c success in SMEs and each factor can be developed in order to improve a company's e-b/c performance. Lack of competence in any of the variable factors is likely to prevent e-b/c system integration. As variable factors improve, the degree of e-b/c success is greatly enhanced. Therefore, each variable factor was used to establish a 'conceptual factor model' where the different levels were classified on a continuous scoring system. The model was then successfully applied to the studied companies instead of using the 'stage model' alone. The use of the framework proved that it was possible to assess a firm's e-b/c performance through a set of critical factors with a scoring system. The framework then developed into a self-assessment tool based on feedback and advice from industries. Finally the tool was successfully applied to six pilot companies which demonstrated that a firm could use this self-assessment tool to improve its performance.

*H f: It may be possible to detect some specific factors which can be shown to have significant impact on the success of e-b/c adoption and development, but which may not be easily addressed or implemented within SMEs.*

Apart from critical success factors, fixed factors (age, size, service orientation, product nature and supply chain) were also identified to have a degree of influence/impact on the success of e-b/c adoption and development. Fixed factors are the external conditions in which a firm operates, and totally define its chances of “success” yet remain an influence largely or completely outside of its ability to change.

A firm’s initial e-b/c model largely depends on a set of fixed factors and each fixed factor may have a different impact on its nature outcomes of e-b/c adoption and development. A negative combination of fixed factors may hinder the progress of e-b/c adoption and development. Fixed factors are generally difficult to change in the short term, subsequently limiting the firm’s power to amend its business model. Therefore, it is critical to recognise these fixed factors and the impact that they may have for each individual company during the early stages of e-b/c adoption so that firms can modify their e-b/c model accordingly.

## CHAPTER 9 CONCLUSIONS

As the e-business/e-commerce field is relatively new and fragmented across different disciplines, addressing issues pertaining to its novel perspectives and linking those with a reference theory is a priority and essential before undertaking a research endeavour. It is a difficult area to research due a lack of current e-business/e-commerce self-assessment framework/tools. In addition, the lack of scientific methods for evaluating results is a hindrance. However, it provides an opportunity for further research and a possible call for more innovative research methods.

This research has investigated a complex and difficult subject area, an area that is becoming increasingly relevant and beneficial to SMEs. It is feasible to argue that SMEs have a significant impact on the UK economy and the success of the UK economy is highly dependent upon the success of the SME sector.

This research project follows on from several previous projects run by Merseyside Small Medium Enterprise Development Centre (MSMEDC) which aimed to stimulate SME growth in the Merseyside region. The knowledge attained from these previous projects, plus valuable input from other experienced researchers within this field, proved to be extremely beneficial to this study.

Many businesses are seeing the recent recession as a “business reset” and are looking at technology to help them become more productive and enable them to gain a greater reach to potential customers. E-business is seen by many as a way of scaling their businesses into new markets without scaling head count. E-business is recognised as an effective business growth strategy for SME growth. The European Commission aims to promote an “Information Society for All” which needs to address the issues of e-business

adoption and use. The UK government is also eager to support SMEs in e-b/c for accelerating economic growth. In reality, the failure rate of e-b/c is very high in SMEs.

Thus, the key purposes of the research are to promote e-b/c awareness, to encourage e-b/c adoption/development and to produce an easy to apply framework/self-assessment tool for e-b/c success in SMEs. The definition of success is perceived differently by each firm and this created great complexity in the study. Extensive observation and data collation was required to study the sample SMEs in order to understand their characteristics, conduct of business and approach to e-b/c.

The key research findings are as follows:

- There are numerous benefits and barriers associated with adopting and developing e-business in SMEs.
- Despite the recognition of e-b/c as a valuable tool to compete with larger firms, SMEs lack e-b/c awareness and e-b/c activity levels are generally low.
- As e-business can have an overall positive impact on SMEs and SME success is paramount to the UK economy, it is perhaps alarming to learn that e-b/c activity in SMEs is relatively low. It is also apparent that adoption and development of e-b/c activities in SMEs appears to be random and painstakingly slow. Therefore, more support and assistance is required for e-b/c implementation in SMEs.
- Small firms differ significantly to larger firms in terms of motivation for e-business adoption, development, integration, business priority and especially the e-business capability.
- Self-assessment tools were identified as a form of benchmarking, a constructive aid commonly used by larger firms to improve business performance as well as increasing business awareness. However, relatively few e-b/c assessment tools exist and these are often complex

to understand and to apply. Furthermore, these tools are deemed unsuitable for SMEs, being specifically designed for larger firms. Most SMEs preferred a self assessment tool that was relatively simple in nature, easy to understand and to apply. For business support agencies, a generic self assessment tool could prove to be more practical.

- 'Stage models' and 'conceptual factor models' are commonly used to assess e-business performance. 'Stage models' are used to identify the level of e-b/c integration, typified by a list of e-applications. 'Conceptual factor models' are used to demonstrate important factors of competence. Models vary depending on the factors outlined by the originating authors.
- Literature suggests that e-b/c system integration is the ultimate solution or strategy to e-business success. Arguably the strategy might be more appropriate and identifiable for larger companies but perhaps not as applicable to the majority of SMEs.
- A list of e-b/c best practices from leading firms was identified, but not all are relevant and significant to SMEs. Some best practices were not even fully recognised by SMEs. SMEs expressed that e-b/c best practice is impractical for them to follow. Best practices or e-b/c implementation models are effective for larger companies but their effectiveness is limited when applied to SMEs.
- Each company is unique in its own approach towards e-b/c adoption/development. Therefore, it was extremely difficult to identify a single business solution suitable for all SMEs. Research did identify a common approach; SMEs implement e-b/c solutions on a piecemeal basis based on perceived business needs.
- A list of key factors was identified as having an influence over the success of e-b/c adoption and development. Eight of these factors were classified as 'variable factors' and these were likely to have direct impact on company e-b/c performance and be potentially improved within a reasonable timeframe.

- Certain factors were identified and subsequently classed as 'fixed factors' as it was highly unlikely that these could be changed within a short timeframe. The majority of SMEs agreed that it was important to be aware of these influences.
- The eight 'variable factors' were used to assess a firm's e-business performance through a continuous scoring system. This formed the basis for a 'conceptual factor model' which was then subsequently used as a proposed self assessment framework. The framework then converted to an easy to apply e-b/c self-assessment tool, which was applied to six pilot companies and received positive feedback on its usability and effectiveness.

In conclusion, the majority of SMEs lack awareness and understanding of the potential benefits of e-b/c adoption and development. Consequently, e-b/c performance remains at a basic level. Numerous differences exist between small and large firms and a strategy or framework which has successfully reaped benefits for a larger firm may not be appropriate for the smaller firm. Helping SMEs grow through the use of e-business is a difficult task. E-business self assessment tools are commonly used to improve business performance as well as increasing business awareness but are surprisingly underdeveloped for SMEs. 'Stage models' are used to assess a firm's e-b/c performance based on the level of integration and are more useful for providing a general performance overview. However, they lack the practical benefits required for SMEs. SMEs implement e-b/c solutions on a piecemeal basis. The common strategy is to apply different e-applications in the areas of business which are perceived to be the priority. The essence of this approach is likely to be captured by a set of 'variable factors' which have direct influence on a firm's e-b/c performance. The research also identified a set of 'fixed factors' which accurately describes a firm's characteristics and also bear influence over e-b/c performance. Variable factors are used to assess the level of e-b/c activity in each critical area through a continuous

scoring system, forming an '8 dimensions factor model'. Based on the results from both theoretical and practical work, the model was used as the basis for the production of an e-b/c self assessment framework specifically designed and aimed at small firms. This could then be used to assess a firm's performance against the highest level of critical e-b/c area and additionally help to identify opportunities for further improvement. The framework was then converted into a practical self-assessment tool and used in six pilot companies, receiving positive feedback on its usability and effectiveness. It was designed after extensive consultation from a theoretical and practical perspective involving literature research and feedback from company owners and business support agencies. The development of the tool is arguably innovative in its approach as no such product existed previously, which can be seen as a significant contribution to knowledge.

For small companies, the self-assessment tool could serve as a road map for e-b/c adoption, implementation and development and be used to:

- assess a company's current e-b/c capability and performance
- identify the level of e-b/c integration and possible future development
- analyse the gap between companies' current performance, targets and best scenario
- identify companies' priorities for e-b/c development
- re-assess companies' e-b/c performance

For business support agencies, it could serve as a generic advisory tool for any small or start-up firm looking to adopt or develop e-business as a part of business strategy. The tool has been tested with several small companies (including ChinaLink and Mersey Maritime Ltd) and received positive feedback for its usability and effectiveness.

The outcome of this research fulfills the original research aims and objectives. Regardless of a firm's size, age, service orientation products complexity and supply chain pressure, it is possible that its e-business/e-commerce capabilities can be assessed in overall terms by the application of a model which in turn could form the basis of an improvement process/methodology. All the hypotheses are fully supported by the key findings.

The limitations of this research work include sample size, SME availability, population representativeness and validation. Most of the participating case study companies were small and geographically restricted to the Merseyside region. It was very difficult to engage SMEs from other parts of the country to contribute to the research project. In addition, it was impossible to benchmark against the best practice e-businesses from SMEs, particularly those in low-tech sectors. The self-assessment tool was produced at the end of the research project and extensive evaluation and validation was limited due to time restrictions. The limitations and the outcomes of this research set a natural theme for further study and research and this is discussed in Chapter 10.



## CHAPTER 10 FUTURE WORK AND RECOMMENDATIONS

The ideal scenario for proving the validity of the e-b/c self-assessment tool is to involve a large number of best practice SMEs across different sectors in each critical area or all areas, and to evaluate the activities involved and monitor their development. Obviously such testing would be extremely difficult and time consuming, taking it beyond the scope of this current research project.

At the end of the research project, a generic e-b/c self-assessment tool was proposed and applied to six pilot companies. The tool was highly praised by the companies involved as it enabled them to establish a baseline of their current business position and the development required to reach a future and more desirable position, subject to undergoing certain changes. Despite the positive feedback received, the author recognises that the tool is likely to help to increase e-b/c awareness and to indicate business direction rather than serve as a guarantee to attaining good business results. The tool is not a miracle cure for all of the problems that beset SMEs in e-business/e-commerce rather it is based on logic and rigorous research.

Therefore, it is important that the researcher carefully considers how the research results can be applied. Areas for further research have been identified as follows:

1. Implementation of the framework and tool: to refine and tighten the scaling mechanism, to link the model more closely to an “improvement” programme for the firms studied by re-visiting and conducting further practical work.

2. To increase the number of firms studied, in particular the best practice companies in order to improve the variable factor “set” and in turn, find a better “fit” with more business sectors such as service and manufacturing, or other countries such as China or India.
3. To explore the possibility of developing the self assessment framework into an easy to apply software application.
4. A further study into e-business/e-commerce strategies and applications for each critical area in order to produce a detailed guidance/workbook on how to improve SMEs’ e-b/c performance rather than what is involved in the process to success.
5. Implement innovative methods to bridge the existing divide between SMEs and e-business/e-commerce.

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**Web Links:**

BRINT.com ([www.brint.com](http://www.brint.com))

PwC Barometer Surveys ([www.barometersurvey.com](http://www.barometersurvey.com)): research on e-business strategy

e-Commerce Times ([www.ecommerce.ac.uk](http://www.ecommerce.ac.uk))

e-Commerce About.com ([www.ecommerce.about.com](http://www.ecommerce.about.com))

US Centre for e-business ([www.ebusiness.mit.edu](http://www.ebusiness.mit.edu))

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[www.nua.net/surveys/how\\_many\\_online/world.html](http://www.nua.net/surveys/how_many_online/world.html)

Business Link ([www.businesslink.gov.uk](http://www.businesslink.gov.uk))

## **Appendix 1: Greater Merseyside Broadband Project (GMBP)**

### **Press Release**

**For Immediate Release**

**Thursday 5<sup>th</sup> August, 2004**

The Greater Merseyside Broadband Project. – MerseyBroadband ([www.merseybroadband.com](http://www.merseybroadband.com)) is a multi-million Northwest Development Agency funded project aimed at promoting the use of broadband technologies and applications in local communities and small to medium sized enterprises in the Greater Merseyside area.

Led by Liverpool Chamber of Commerce and Industry with the support of a number of key specialist local support bodies, this project will demonstrate and encourage businesses and communities across the Greater Merseyside region to adopt broadband technologies.

The project is divided into five complementary strands that work towards the development and success of the project, and together deliver a dynamic and coherent programme that responds directly to the challenge and potential that broadband represents in the region. The supporting strands and their roles within the programme are:

#### **Strand 1: Community Content**

- Create platforms for direct community engagement with broadband technologies
- Pilot a model for the development and sustainable delivery of broadband content into disadvantaged urban areas that can be replicated in Greater Merseyside
- Engage businesses and residential communities in an effort to improve awareness of the capability of services delivered by broadband

## Strand 2: Enabling SME's

- Encourage local content providers to promote the benefits of an integrated working broadband environment
- Removing the fear businesses feel when thinking about outsourcing part of their IT capabilities/systems
- Encourage Businesses to take adequate steps to develop and test data backup procedures
- Prevent business victims of crime from being targeted again

## Strand 3: Marketing, Awareness Raising and ICT support

- Drive a hundred percent increase in SME take-up of broadband technology
- Identify opportunities to introduce more integrated broadband enabled business applications to improve productivity, efficiency and competitiveness
- Identify those business areas of greatest demand and potential benefit

## Strand 4: Teleworking

- Bring the benefits of broadband Teleworking to the smaller businesses and help reduce their cost base, environmental impact and increase their competitiveness
- Capitalise on the demand for remote working

## Strand 5: Community Chest

- Enable a rapid response to local broadband opportunities
- Support Applicant proposals, and provide a rapid, local response to those proposals
- Support projects that target the benefits provided by broadband in all industrial and societal activities

## Appendix 2: Greater Merseyside Broadband Project: e-Business/Commerce Survey

### CONTACT AND COMPANY DETAILS

Your full name (d1):..... Job title (d2) : ..... Date (d3):

.....

Company name (d4): ..... In which sector is your company: Service  Manufg

Company address (d5):..... Post Code (d6):.....

Telephone No (d7):..... E-mail (d8):.....

### E-BUSINESS/COMMERCE (e-C/B)

By e-C/B we mean any Internet based business activity ranging from e-mail, through static and dynamic web sites to fully integrated business activities such as supply chain management.

### ANSWERING THE QUESTIONNAIRE

Please answer the questions (by marking with an X) the best that you can, there are no right or wrong answers. Please contact us (last page) if you need any clarification. There are two types of questions:

1. Single choice: Choose one option (this is the main type of question)
2. Multiple choice: Choose as appropriate or rank them in order

### COMPANY INFORMATION

1. How many years has your company been in business?

Less than 1 <sub>1</sub>      2-5 <sub>2</sub>      6-10 <sub>3</sub>      more than 10 <sub>4</sub>

2. What is the total number of employees in your company?

1-9 <sub>1</sub>      10-49 <sub>2</sub>      50- 99 <sub>3</sub>      100 - 249 <sub>4</sub>      250 plus <sub>5</sub>

3. What was your approximate sales turnover (in £000s) in the last financial year?

Below 100 <sub>1</sub>      100 to 249 <sub>2</sub>      250 to 1,000 <sub>3</sub>      Over 1,000 <sub>4</sub>

### INFORMATION & COMMUNICATION TECHNOLOGY (ICT) BASE

4. What is your current ICT capability?

You have IT in-house expertise

<sub>a</sub> (if tick the box = 1, if not then = 0)

You have a support contract with an external company

<sub>b</sub> (if tick the box = 1, if not then = 0)

You call for support on an ad-hoc basis when required

<sub>c</sub> (if tick the box = 1, if not then = 0)

<sub>d</sub> Others (please specify) .....

5. What is the approximate total value of your ICT provision (£000s)?

Under 1 <sub>1</sub>      1-5 <sub>2</sub>      6-10 <sub>3</sub>      11-25 <sub>4</sub>      26-100 <sub>5</sub>      Over 100 <sub>6</sub>

6. How many desktop PCs does your company use for business purposes?

None <sub>1</sub>      1-5 <sub>2</sub>      6-10 <sub>3</sub>      More than 10 <sub>4</sub>

7. How many laptop computers does your company use for business purposes?

None <sub>1</sub>      1-5 <sub>2</sub>      6-10 <sub>3</sub>      More than 10 <sub>4</sub>

8. How many mobile communication devices in your company

<sub>a</sub> Mobile Phones : None <sub>1</sub>      1-5 <sub>2</sub>      6-10 <sub>3</sub>      More than 10 <sub>4</sub>

<sub>b</sub> PDAs : None <sub>1</sub>      1-5 <sub>2</sub>      6-10 <sub>3</sub>      More than 10 <sub>4</sub>

<sub>c</sub> Other (please specify).....

9<sub>a</sub>. Which software products do you use mainly? <sub>b</sub> Other specialist software (Please specify):

Microsoft <sub>1</sub>      Sage <sub>2</sub>      Apple <sub>3</sub>      Unix etc <sub>4</sub>

10. What part of your ICT system do you want to upgrade in next 12 months? (if tick the box = 1, if

not then = 0) Hardware <sub>a</sub>      Software <sub>b</sub>      Internet connection <sub>c</sub>  
Network <sub>d</sub>      Servers <sub>e</sub>      Website <sub>f</sub>      None <sub>g</sub>

### CURRENT e-C/B STATUS

11. Are you involved in any e-C/B at present? Yes <sub>1</sub> No <sub>0</sub>  
 If No go to question 12. If Yes go to question 13

12. Why do you not use e-C/B? Please state reason(s).....

13. How many years have you been involved in e-C/B?  
 0-2 <sub>1</sub> 3-5 <sub>2</sub> 6-10 <sub>3</sub> More than 10 <sub>4</sub>

14. Which Internet connection does your company use?  
 Dial up <sub>1</sub> Broadband <sub>2</sub> Leased line <sub>3</sub> ISDN <sub>4</sub>

If "Broadband", go to question 16. If other than "Broadband", go to question 15

15. Why doesn't your company have a Broadband connection (Choose as appropriate)?

(if tick the box = 1, if not then = 0)

- |   |   |
|---|---|
| No need for high speed <input type="checkbox"/> <sub>a</sub>  | Equipment costs too high <input type="checkbox"/> <sub>b</sub>  |
| Access costs too high <input type="checkbox"/> <sub>c</sub>   | Don't perceive any value <input type="checkbox"/> <sub>d</sub>  |
| Lack of in-house skills <input type="checkbox"/> <sub>e</sub> | Lack of training <input type="checkbox"/> <sub>f</sub>          |
| Security concerns <input type="checkbox"/> <sub>g</sub>       | Don't have time to use it <input type="checkbox"/> <sub>h</sub> |

i Others (please specify) .....

16. How long have you been using Broadband (months)?  
 Less than 6 <sub>1</sub> 7-12 <sub>2</sub> 13-36 <sub>3</sub> More than 36 <sub>4</sub>

17. If you use Broadband, what are the main benefits of Broadband to your business (Choose as appropriate)? (if tick the box = 1, if not then = 0)

- |   |  |  |
|---|--|--|
| Save time <input type="checkbox"/> <sub>a</sub>                           | Productivity gains <input type="checkbox"/> <sub>b</sub> | Efficient Internet use <input type="checkbox"/> <sub>c</sub>   |
| Supplier demand <input type="checkbox"/> <sub>d</sub>                     | Customer demand <input type="checkbox"/> <sub>e</sub>    | Improves quality of life <input type="checkbox"/> <sub>f</sub> |
| Simultaneous Internet and Telephone <input type="checkbox"/> <sub>g</sub> | h Other (please specify) .....                           |  |

**e-C/B STATUS**

18. Please read the statements below and tick the one that best describes your company. Answer for the current state and your possible intentions in the future (next 1-2 years)

- |  | Current (a)                           | Future (b)                            |
|--|---------------------------------------|---------------------------------------|
| <b>I. Start stage:</b> Little/no ICT use, skills and expertise.<br>Limited or no knowledge and awareness of e-B/C                              | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>1</sub> |
| <b>II. Entry Stage:</b> Using e-mail, basic IT skills, some knowledge and awareness of e-B/C   | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>2</sub> |
| <b>III. Presence Stage:</b> Using e-mail for effective internal and external communication and website only for publishing information         | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>3</sub> |
| <b>IV. e-Commerce Stage:</b> Range of ICT skills, mid-level knowledge of e-C/B.<br>Online ordering, Internet marketing and online transaction. | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>4</sub> |
| <b>V. e-Business Stage:</b> Good level of ICT knowledge and application, of skills. Linked CRM system and integrated supply chain.             | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>5</sub> |
| <b>VI. Transformed Stage:</b> Completely integrated with suppliers, customers and partners in a "collaborative organisation".                  | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>6</sub> |

**e-C/B BENEFITS**

19. We would like to know the benefits you get from e-C/B. Please score each as follows:

1=Low 5=High

- |                    |   |   |   |   |   |
|--------------------|---|---|---|---|---|
| a) Competitiveness | 1 <input type="checkbox"/> <sub>1</sub> | 2 <input type="checkbox"/> <sub>2</sub> | 3 <input type="checkbox"/> <sub>3</sub> | 4 <input type="checkbox"/> <sub>4</sub> | 5 <input type="checkbox"/> <sub>5</sub> |
| b) Operations      | 1 <input type="checkbox"/> <sub>1</sub> | 2 <input type="checkbox"/> <sub>2</sub> | 3 <input type="checkbox"/> <sub>3</sub> | 4 <input type="checkbox"/> <sub>4</sub> | 5 <input type="checkbox"/> <sub>5</sub> |
| c) Sales           | 1 <input type="checkbox"/> <sub>1</sub> | 2 <input type="checkbox"/> <sub>2</sub> | 3 <input type="checkbox"/> <sub>3</sub> | 4 <input type="checkbox"/> <sub>4</sub> | 5 <input type="checkbox"/> <sub>5</sub> |
| d) Communication   | 1 <input type="checkbox"/> <sub>1</sub> | 2 <input type="checkbox"/> <sub>2</sub> | 3 <input type="checkbox"/> <sub>3</sub> | 4 <input type="checkbox"/> <sub>4</sub> | 5 <input type="checkbox"/> <sub>5</sub> |
| e) Suppliers       | 1 <input type="checkbox"/> <sub>1</sub> | 2 <input type="checkbox"/> <sub>2</sub> | 3 <input type="checkbox"/> <sub>3</sub> | 4 <input type="checkbox"/> <sub>4</sub> | 5 <input type="checkbox"/> <sub>5</sub> |
| f) Financial       | 1 <input type="checkbox"/> <sub>1</sub> | 2 <input type="checkbox"/> <sub>2</sub> | 3 <input type="checkbox"/> <sub>3</sub> | 4 <input type="checkbox"/> <sub>4</sub> | 5 <input type="checkbox"/> <sub>5</sub> |

g) Others (please specify) .....

### e-C/B BARRIERS

20. We would like to know what barriers you face in using e-C/B. Please score each as follows:

1=Low 5=High

- a) **ICT:** e.g. poor functionality of website  
Difficulty of integrating with external systems 1 <sub>1</sub> 2 <sub>2</sub> 3 <sub>3</sub> 4 <sub>4</sub> 5 <sub>5</sub>
- b) **e-C/B skills/knowledge:** lack of support, in-company expertise, staff training/knowledge of e-C/B processes. 1 <sub>1</sub> 2 <sub>2</sub> 3 <sub>3</sub> 4 <sub>4</sub> 5 <sub>5</sub>
- c) **e-C/B awareness:** Personal and managerial of awareness of e-C/B process, problems and potential for the business 1 <sub>1</sub> 2 <sub>2</sub> 3 <sub>3</sub> 4 <sub>4</sub> 5 <sub>5</sub>
- d) **Resources:** Funding, budget, general support. Perceptual and physical limitations. 1 <sub>1</sub> 2 <sub>2</sub> 3 <sub>3</sub> 4 <sub>4</sub> 5 <sub>5</sub>
- e) **Management:** Appropriate e-C/B business strategy Process, operation and implementation limitations. 1 <sub>1</sub> 2 <sub>2</sub> 3 <sub>3</sub> 4 <sub>4</sub> 5 <sub>5</sub>
- f) **Security:** Risks and privacy issues. Difficulties with confidentiality and in sharing knowledge/information. 1 <sub>1</sub> 2 <sub>2</sub> 3 <sub>3</sub> 4 <sub>4</sub> 5 <sub>5</sub>
- g) **Costs:** From initial start-up cost to replacement and/or upgrade costs. Technology/system maintenance. 1 <sub>1</sub> 2 <sub>2</sub> 3 <sub>3</sub> 4 <sub>4</sub> 5 <sub>5</sub>
- h) **Other:** Please specify: .....

### CUSTOMERS & SUPPLIERS

21. How many customers do you have?

Under 10 <sub>1</sub> 10-24 <sub>2</sub> 25-100 <sub>3</sub> Over 100 <sub>4</sub>

22. How many suppliers do you have?

Under 10 <sub>1</sub> 10-24 <sub>2</sub> 25-100 <sub>3</sub> Over 100 <sub>4</sub>

23. How do you deal mainly with orders (customer and supplier)? Please choose one from each:

	Mail	'Phone	Fax	E-mail	Electronic system
a) Customers	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
b) Suppliers	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>

### BUSINESS STRATEGY:

24. Would you like to grow your business Yes <sub>1</sub> No <sub>2</sub> Don't know <sub>3</sub>

25. If Yes, what % of sales increase would you realistically like to achieve in next two years?

Up to 5 <sub>1</sub> 6-10 <sub>2</sub> 11-20 <sub>3</sub> More than 20 <sub>4</sub>

26. Are you involved in any supply chain activities? Yes <sub>1</sub> No <sub>0</sub>

27. If Yes, please state which: .....

### FOLLOW UP

28. Would you be prepared to be involved in a short follow-up interview? Yes <sub>1</sub> No <sub>0</sub>

Thank you for your help in completing the questionnaire

### FOR ADVICE ON:

Completing the questionnaire:

Jenny Shi  
j.w.shi@livjm.ac.uk

0151 231 2502

The Broadband project and funding:

0845 1451115

www.merseybroadband.com

### **Appendix 3: Interviews with Merseyside firms**

Thanks for your participation in an interview exploring the current e-b/c activities in your companies. The interview will last approximately 40 minutes. It aimed to examine your current e-b/c status/activities by our 'e-b/c stage model'. You will be also asked questions about e-b/c integration, implementation model(s) and barriers of e-b/c adoption/development. All your views relating to questions are welcomed. Thanks for your time! The questions that we proposed are as follows:

- (1) What are the main reasons for the failure of e-b/c adoption? Why?
- (2) Do you have an integrated e-b/c system? If not, why?
- (3) Please can you recognise the stage of your current e-b/c status by benchmarking our stage model?
- (4) Which stage ideally would you like to be developed to?
- (5) Do you know how to get to the ideal stage?
- (6) What do you think of our stage model?

Thanks for your participation!

Jenny (Jiwei) Shi  
Research Associate  
Liverpool John Moores

## **Appendix 4: Stage Model**

### **1 Start Stage:**

Little/no ICT use, skills and expertise. The companies are willing to adopt e-b/c but they only have limited or no knowledge and awareness of e-b/c.

### **2 Entry Stage:**

Starting to adopt e-b/c but just using email, basic IT skills with some knowledge and awareness of e-b/c.

### **3 Presence Stage:**

Using e-mail for effective internal and external communication, companies' websites only exist for publishing information.

### **4 e-Commerce Stage:**

Having reasonable level of ICT skills and knowledge of e-b/c. Companies' websites are functional and can achieve some basic e-b/c applications e.g. online ordering, Internet marketing and online transaction.

### **5 e-Business Stage:**

Companies have good level of ICT knowledge, skills and e-b/c applications e.g. linked CRM system and integrated supply chain.

### **6 Transformed Stage:**

Companies' e-b/c system is completely integrated with their suppliers', customers' and partners' in a "collaborative electronic organisation".



## Appendix 5.1 Questionnaire

OFFICE CODE

### SME GROWTH THROUGH e-BUSINESS/COMMERCE

We are investigating e-Business/Commerce development in SMEs and the various aspects and factors that impact on e-Business/Commerce. We aim to accelerate company e-B/C performance for business growth. This questionnaire is designed to identify a range of success factors impacting on e-B/C. It consists 4 parts:

Part 1: Company Detail

Part 2: Company Information

Part 3: e-B/C activity levels (i.e. What e-B/C lever your company has in various functions)

Part 4: e-B/C practices. (i.e. The e-B/C practice you use in your company)

It should take you about 20-30 minutes to complete the survey. If you need help / explanations, please contact the address on page Thanks very much for your help!

#### COMPANY DETAILS

Your full name: .....Job title:.....Date:.....

Company name:.....Tel:.....Post Code:.....

Company address:.....E-mail:.....

Are you involved in any business by use of Internet/website and other e-technologies? Yes  No

If your answer is "Yes", please help us by completing this questionnaire. If your answer is "No", you have already completed this questionnaire. In either case, please return the questionnaire to the contact on page 3.

#### COMPANY INFORMATION

Please use "x" to tick the **ONE** box that most closely fits your company in questions 1 to 6:

1. What is the total number of employees in your company? (ONLY TICK ONE BOX)

1 – 49 1      50 – 99 2      100 – 149 3      150-249 4

2. Please select the industry sector that is most appropriate to your company.

(ONLY TICK ONE BOX)

Manufacturing 1      Hotel & Restaurant 3      Telecommunications 5      Other Services 6

Retail/Wholesale 2      Banks & Insurance companies 4

Main products/services:.....

3. What was the main reason for you to take up or update your e-B/e-C activities?

(ONLY TICK ONE BOX)

Customers 1      Suppliers 3      Trading partners 5

Competition 2      Future trend 4      Life style 6

4. What are your business goals? (ONLY TICK ONE BOX)

Growth 1      Lifestyle business 2      Maintain current size 3

Sell out in the near future 4      Others (please specify): .....

5. What method do you use to connect the Internet? (ONLY TICK ONE BOX)

Broadband 1      ISDN 2      Dial - up Internet connection 3

6. What kind of PC network do you have? (ONLY TICK ONE BOX)

Unlinked PCs 1      Wide Area Network (WAN) 3      Others (please specify):.....

Linked PCs(LAN) 2      Mini Computer System (terminals) 4

Please use "x" to tick any of the following **BOXES** that are appropriate in questions 7 to 10:

7. How do you mainly communicate with employees, customers, suppliers and partners?  
 Phones and fax  Email  Website  Intranet/extranet   
 Others (please specify):.....
8. What main areas do you want to improve in your business through e-business?  
 Communication  Marketing  Sale  Customer Service   
 Collaboration  Purchasing  Resource Management   
 Others (please specify) .....
9. How do you solve ICT problems?  
 Call for support on an ad-hoc basis  Contracted external support   
 In-house ICT staffs/expertise  Others (please specify):.....
10. Do you use any remote/mobile terminals for work at all?  
 Mobile phones  PDA/laptops  Wireless devices   
 Bluetooth devices  Videoconference  Others (please specify):.....

**E-BUSINESS/COMMERCE ACTIVITY LEVELS**

Please use "x" to tick the **ONE** box in each section that most closely describes your business activity in questions 11 to 15:

11. **Purchasing** (What are your purchasing methods/procedures?)  
 We source goods / suppliers through traditional ways (company directory, goods catalogue, calls). 1  
 We source goods / suppliers mainly online but with traditional payment method. 2  
 We source goods / suppliers online and deal with payment through online transaction. 3  
 Our online system allows us deal with whole the purchasing process electronically and automatically 4
12. **Resource management** (How systematic is your resource management process?)  
 We do not regularly or systematically review demand and resource balance. 1  
 We review when a problem is indicated. 2  
 We regularly review using capacity planning techniques. 3  
 We use electronic business control systems for regular capacity review. 4
13. **Marketing** (How efficient is your marketing?)  
 We do not undertake marketing. 1  
 Our marketing is mostly executed in traditional media (newspaper/radio/TV/exhibition). 2  
 Our marketing is mostly executed online. 3  
 We are not only marketing online but also promoting it by other media. 4
14. **Sales** (How efficient is your sales?)  
 We approach customers and take orders from them in traditional ways (phones, fax and emails). 1  
 We approach customers mainly through online catalogue but still deal with orders / sales in traditional ways. 2  
 Our customers can order/modify orders and pay online. 3  
 The whole process of sales is done electronically. 4

**15. Customer service (How efficient is your customer service?)**

We only offer customer service within office hours. 1

We offer customer service both offline and online at any times via phone, letter, fax, emails and website. 2

We offer personalised customer service through our website, responding to queries via online system. 3

We create online communities for our customers. 4

**E-BUSINESS/COMMERCE PRACTICES**

**Please circle the ONE score from each of the questions 16 to 30:**

1= "NOT IMPORTANT" or "VERY IMPORTANT"

5= "CRITICAL" or "VERY GOOD"

How important  
is it to you?

How good  
are you at it?

**Example: Q: We always have a clear e-business goal and vision**      1- 2 - 3 - **4** - 5      1- 2 - **3** - 4 - 5

16. We always have a clear e-B/C goal and vision of what to do next.      1- 2 - 3 - 4 - 5      1- 2 - 3 - 4 - 5

17. We always prioritize e-B/C activities based on our business needs.      1- 2 - 3 - 4 - 5      1- 2 - 3 - 4 - 5

18. We are fully aware of the benefits that e-B/C bring to our business.      1- 2 - 3 - 4 - 5      1- 2 - 3 - 4 - 5

19. We are fully aware of e-B/C relevant regulations and laws.      1- 2 - 3 - 4 - 5      1- 2 - 3 - 4 - 5

20. We always respond to customers' needs quickly through e-B/C system.      1- 2 - 3 - 4 - 5      1- 2 - 3 - 4 - 5

21. We collaborate by sharing business activities online with our trading partners.      1- 2 - 3 - 4 - 5      1- 2 - 3 - 4 - 5

22. We survey employees and trading partners to evaluate e-B/C impact on them.      1- 2 - 3 - 4 - 5      1- 2 - 3 - 4 - 5

23. We budget on every e-B/C project.      1- 2 - 3 - 4 - 5      1- 2 - 3 - 4 - 5

24. We constantly review information technology strategy.      1- 2 - 3 - 4 - 5      1- 2 - 3 - 4 - 5

25. We empower people through information sharing electronically.      1- 2 - 3 - 4 - 5      1- 2 - 3 - 4 - 5

26. We use online training for staff development.      1- 2 - 3 - 4 - 5      1- 2 - 3 - 4 - 5

27. We define and deliver security / privacy policies to all parties involved.      1- 2 - 3 - 4 - 5      1- 2 - 3 - 4 - 5

28. We control different levels of authority to access the company's data.      1- 2 - 3 - 4 - 5      1- 2 - 3 - 4 - 5

29. We provide a secure, private and reliable system for all users.      1- 2 - 3 - 4 - 5      1- 2 - 3 - 4 - 5

30. We can work remotely.      1- 2 - 3 - 4 - 5      1- 2 - 3 - 4 - 5

**Follow Up** 31. Would you like a copy of this questionnaire results?      Yes       No

32. Would you be interested to be involved in a short follow-up interview?      Yes       No

**Return / Contact Details:**

**Contact Name:** Jiwei Shi  
**Contact Address:** Room210, Technology Management Group  
 James Parsons Building  
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**Appendix 5.2: Small vs. Medium Firms: e-b/c driver**

**The main reason for a company to take up or update their e-B/C activities \* total number of employees in the company Crosstabulation**

		total number of employees in the company		Total
		Small firms (1-49)	Medium firms (50-249)	
the main reason for customers a company to take up or update their e-B/C activities	Count	26	7	33
	% within total number of employees in the company	72.2%	50.0%	66.0%
competition	Count	2	1	3
	% within total number of employees in the company	5.6%	7.1%	6.0%
future trend	Count	5	3	8
	% within total number of employees in the company	13.9%	21.4%	16.0%
trading partners	Count	3	3	6
	% within total number of employees in the company	8.3%	21.4%	12.0%
Total	Count	36	14	50
	% within total number of employees in the company	100.0%	100.0%	100.0%

**Appendix 5.3: Small vs. Medium Firms: service orientation:**

**Total number of employees in the company \* industry sector that is most appropriate to the company Crosstabulation**

Count

		industry sector that is most appropriate to the company		Total
		Manufacturing	service	
total number of employees in the company	1-49	7	30	37
	50-249	3	11	14
Total		10	41	51

## Appendix 5.4 Small vs. Medium Firms: business goals

The main business goal of the company \* total number of employees in the company  
Crosstabulation

		total number of employees in the company		Total
		Small firms (1-49)	Medium firms (50-249)	
the main business growth goal of the company	Count	33	13	46
	% within total number of employees in the company	89.2%	92.9%	90.2%
lifestyle business	Count	2	0	2
	% within total number of employees in the company	5.4%	.0%	3.9%
maintain current size	Count	2	1	3
	% within total number of employees in the company	5.4%	7.1%	5.9%
Total	Count	37	14	51
	% within total number of employees in the company	100.0%	100.0%	100.0%

## Appendix 5.5 Small vs. Medium Firms: ICT network

The PC network in the company \* total number of employees in the company  
Crosstabulation

		total number of employees in the company		Total
		Small firms (1-49)	Medium firms (50-249)	
the PC network Unlinked PCs in the company	Count	12	1	
	% within total number of employees in the company	32.4%	7.1%	25.5%
Linked PCs (LAN)	Count	23	7	30
	% within total number of employees in the company	62.2%	50.0%	58.8%
Wide Area Network (WAN)	Count	2	6	8
	% within total number of employees in the company	5.4%	42.9%	15.7%
Total	Count	37	14	51
	% within total number of employees in the company	100.0%	100.0%	100.0%

## Appendix 5.6 Small vs. Medium Firms: Internet Connection

A method is used to connect the Internet \* total number of employees in the company Crosstabulation

			total number of employees in the company		Total
			Small firms (1-49)	Medium firms (50-249)	
a method is used to connect the Internet	broadband	Count % within total number of employees in the company	34 91.9%	13 100.0%	47 94.0%
	ISDN	Count % within total number of employees in the company	2 5.4%	0 .0%	2 4.0%
	Dial-up Internet connection	Count % within total number of employees in the company	1 2.7%	0 .0%	1 2.0%
Total		Count % within total number of employees in the company	37 100.0%	13 100.0%	50 100.0%

## Appendix 5.7 Small vs. Medium Firms: communication methods

			mainly using phone and fax to communicate with their employees, customers, suppliers and partners		Total
			yes	no	
total number of employees in the company	Small firms (1-49)	Count % within total number of employees in the company	32 86.5%	5 13.5%	37 100.0%
	Medium firms (50-249)	Count % within total number of employees in the company	9 64.3%	5 35.7%	14 100.0%
Total		Count % within total number of employees in the company	41 80.4%	10 19.6%	51 100.0%

**Table 5.7.1 Total number of employees in the company \* mainly using phone and fax to communicate with their employees, customers, suppliers and partners Crosstabulation**

			mainly using email to communicate with their employees, customers, suppliers and partners		Total
			yes	no	
total number of employees in the company	Small firms (1-49)	Count % within total number of employees in the company	33 89.2%	4 10.8%	37 100.0%
	Medium firms (50-249)	Count % within total number of employees in the company	14 100.0%	0 .0%	14 100.0%
Total		Count % within total number of employees in the company	47 92.2%	4 7.8%	51 100.0%

**Table 5.7.2 total number of employees in the company \* mainly using email to communicate with their employees, customers, suppliers and partners Crosstabulation**

			mainly using Website to communicate with their employees, customers, suppliers and partners		Total
			yes	no	
total number of employees in the company	Small firms (1-49)	Count % within total number of employees in the company	18 48.6%	19 51.4%	37 100.0%
	Medium firms (50-249)	Count % within total number of employees in the company	3 21.4%	11 78.6%	14 100.0%
Total		Count % within total number of employees in the company	21 41.2%	30 58.8%	51 100.0%

**Table 5.7.3 total number of employees in the company \* mainly using Website to communicate with their employees, customers, suppliers and partners Crosstabulation**

			mainly using Intranet and extranet to communicate with their employees, customers, suppliers and partners		Total
			yes	no	
total number of employees in the company	Small firms (1-49)	Count	4	33	37
		% within total number of employees in the company	10.8%	89.2%	100.0%
	Medium firms (50-249)	Count	4	10	14
		% within total number of employees in the company	28.6%	71.4%	100.0%
Total		Count	8	43	51
		% within total number of employees in the company	15.7%	84.3%	100.0%

**Table 5.7.4 total number of employees in the company \* mainly using Intranet and extranet to communicate with their employees, customers, suppliers and partners Crosstabulation**

## Appendix 5.8 Small vs. Large Firms: business Priority

			the company want to improve Communication in their business by using e-business		Total
			yes	no	
total number of employees in the company	Small firms (1-49)	Count	25	12	37
		% within total number of employees in the company	67.6%	32.4%	100.0%
	Medium firms (50-249)	Count	9	5	14
		% within total number of employees in the company	64.3%	35.7%	100.0%
Total		Count	34	17	51
		% within total number of employees in the company	66.7%	33.3%	100.0%

**Table 5.8.1 total number of employees in the company \* the company want to improve communication in their business by using e-business Crosstabulation**



			the company want to improve Collaboration in their business by using e-business		Total
			yes	no	
total number of employees in the company	Small firms (1-49)	Count % within total number of employees in the company	7 18.9%	30 81.1%	37 100.0%
	Medium firms (50-249)	Count % within total number of employees in the company	2 14.3%	12 85.7%	14 100.0%
Total		Count % within total number of employees in the company	9 17.6%	42 82.4%	51 100.0%

**Table 5.8.2 total number of employees in the company \* the company want to improve Collaboration in their business by using e-business Crosstabulation**

			the company want to improve Marketing in their business by using e-business		Total
			yes	no	
total number of employees in the company	Small firms (1-49)	Count % within total number of employees in the company	29 78.4%	8 21.6%	37 100.0%
	Medium firms (50-249)	Count % within total number of employees in the company	5 35.7%	9 64.3%	14 100.0%
Total		Count % within total number of employees in the company	34 66.7%	17 33.3%	51 100.0%

**Table 5.8.3 total number of employees in the company \* the company want to improve marketing in their business by using e-business Crosstabulation**

			the company want to improve Sales in their business by using e-business		Total
			yes	no	
total number of employees in the company	Small firms (1-49)	Count % within total number of employees in the company	22 59.5%	15 40.5%	37 100.0%
	Medium firms (50-249)	Count % within total number of employees in the company	8 57.1%	6 42.9%	14 100.0%
Total		Count % within total number of employees in the company	30 58.8%	21 41.2%	51 100.0%

**Table 5.8.4 total number of employees in the company \* the company want to improve Sales in their business by using e-business Crosstabulation**

			the company want to improve Purchasing in their business by using e-business		Total
			yes	no	
total number of employees in the company	Small firms (1-49)	Count % within total number of employees in the company	4 10.8%	33 89.2%	37 100.0%
	Medium firms (50-249)	Count % within total number of employees in the company	2 14.3%	12 85.7%	14 100.0%
Total		Count % within total number of employees in the company	6 11.8%	45 88.2%	51 100.0%

**Table 5.8.5 total number of employees in the company \* the company want to improve Purchasing in their business by using e-business Crosstabulation**

			the company want to improve Resource Management in their business by using e-business		Total
			yes	no	
total number of employees in the company	Small firms (1-49)	Count % within total number of employees in the company	3 8.1%	34 91.9%	37 100.0%
	Medium firms (50-249)	Count % within total number of employees in the company	0 .0%	14 100.0%	14 100.0%
Total		Count % within total number of employees in the company	3 5.9%	48 94.1%	51 100.0%

**Table 5.8.6 total number of employees in the company \* the company want to improve Resource Management in their business by using e-business Crosstabulation**

			the company want to improve Customer Service in their business by using e-business		Total
			yes	no	
total number of employees in the company	Small firms (1-49)	Count % within total number of employees in the company	20 54.1%	17 45.9%	37 100.0%
	Medium firms (50-249)	Count % within total number of employees in the company	10 71.4%	4 28.6%	14 100.0%
Total		Count % within total number of employees in the company	30 58.8%	21 41.2%	51 100.0%

**Table 5.8.7 total number of employees in the company \* the company want to improve Customer Service in their business by using e-business Crosstabulation**

**Appendix 5.9**

**Small vs. Medium Firms: ICT skills/knowledge**

			total number of employees in the company		
			Small firms (1-49)	Medium firms (50-249)	Total
the company calls for support on an ad-hoc basis when they need to solve ICT problems	yes	Count % within total number of employees in the company	13 35.1%	1 7.1%	14 27.5%
	no	Count % within total number of employees in the company	24 64.9%	13 92.9%	37 72.5%
Total		Count % within total number of employees in the company	37 100.0%	14 100.0%	51 100.0%

**Table 5.9.1 the company calls for support on an ad-hoc basis when they need to solve ICT problems \* total number of employees in the company Crosstabulation**

			total number of employees in the company		
			Small firms (1-49)	Medium firms (50-249)	Total
the company calls for contracted external support to solve ICT problems	yes	Count % within total number of employees in the company	14 37.8%	5 35.7%	19 37.3%
	no	Count % within total number of employees in the company	23 62.2%	9 64.3%	32 62.7%
Total		Count % within total number of employees in the company	37 100.0%	14 100.0%	51 100.0%

**Table 5.9.2 the company calls for contracted external support to solve ICT problems \* total number of employees in the company Crosstabulation**

			total number of employees in the company		Total
			Small firms (1-49)	Medium firms (50-249)	
the company has in-house ICT staff/expertise to solve ICT problems	yes	Count % within total number of employees in the company	16 43.2%	11 78.6%	27 52.9%
	no	Count % within total number of employees in the company	21 56.8%	3 21.4%	24 47.1%
Total		Count % within total number of employees in the company	37 100.0%	14 100.0%	51 100.0%

**Table 5.9.3 the company has in-house ICT staff/expertise to solve ICT problems  
\* total number of employees in the company Crosstabulation**

#### **Appendix 5.10 Small vs. Medium Firms: remote working ability**

			total number of employees in the company		Total
			Small firms (1-49)	Medium firms (50-249)	
people in the company use mobile phone working remotely	yes	Count % within total number of employees in the company	33 91.7%	14 100.0%	47 94.0%
	no	Count % within total number of employees in the company	3 8.3%	0 .0%	3 6.0%
Total		Count % within total number of employees in the company	36 100.0%	14 100.0%	50 100.0%

**Table 5.10.1 people in the company use mobile phone working remotely \* total number  
of employees in the company Crosstabulation**

			total number of employees in the company		Total
			Small firms (1-49)	Medium firms (50-249)	
people in the company use PDA/laptops working remotely	yes	Count % within total number of employees in the company	25 71.4%	11 78.6%	36 73.5%
	no	Count % within total number of employees in the company	10 28.6%	3 21.4%	13 26.5%
Total		Count % within total number of employees in the company	35 100.0%	14 100.0%	49 100.0%

**Table 5.10.2 people in the company use PDA/laptops working remotely \* total number of employees in the company Crosstabulation**

			total number of employees in the company		Total
			Small firms (1-49)	Medium firms (50-249)	
people in the company use wireless devices working remotely	yes	Count % within total number of employees in the company	12 34.3%	8 57.1%	20 40.8%
	no	Count % within total number of employees in the company	23 65.7%	6 42.9%	29 59.2%
Total		Count % within total number of employees in the company	35 100.0%	14 100.0%	49 100.0%

**Table 5.10.3 people in the company use wireless devices working remotely \* total number of employees in the company Crosstabulation**

			total number of employees in the company		Total
			Small firms (1-49)	Medium firms (50-249)	
people in the company use videoconference working remotely	yes	Count % within total number of employees in the company	2 5.7%	4 28.6%	6 12.2%
	no	Count % within total number of employees in the company	33 94.3%	10 71.4%	43 87.8%
Total		Count % within total number of employees in the company	35 100.0%	14 100.0%	49 100.0%

**Table 5.10.4 people in the company use videoconference working remotely \* total number of employees in the company Crosstabulation**

			total number of employee in the company		Total
			Small firms (1-49)	Medium firms (50-249)	
people in the company use bluetooth devices working remotely	yes	Count % within total number of employees in the company	11 31.4%	5 35.7%	16 32.7%
	no	Count % within total number of employees in the company	24 68.6%	9 64.3%	33 67.3%
Total		Count % within total number of employees in the company	35 100.0%	14 100.0%	49 100.0%

**Table 5.10.5 people in the company use Bluetooth devices working remotely \* total number of employees in the company Crosstabulation**

## Appendix 5.11 Manufacturing vs. Service Firms: e-b/c drivers

industry sector that is most appropriate to the company \* the main reason for a company to take up or update their e-B/C activities Crosstabulation

		the main reason for a company to take up their e-B/C activities					
		customer	competition	Future trend	trading partners	Total	
industry sector that is most appropriate to the company	manufacturing	Count	9	0	0	1	10
		% within industry sector that is most appropriate to the company	90.0%	.0%	.0%	10.0%	100.0%
	service	Count	24	3	8	5	40
		% within industry sector that is most appropriate to the company	60.0%	7.5%	20.0%	12.5%	100.0%
Total		Count	33	3	8	6	50
		% within industry sector that is most appropriate to the company	66.0%	6.0%	16.0%	12.0%	100.0%

## Appendix 5.12 Manufacturing vs. Service Firms: business goals

industry sector that is most appropriate to the company \* the main business goal of the company Crosstabulation

		the main business goal of the company			Total	
		growth	lifestyle business	maintain current size		
industry sector that is most appropriate to the company	manufacturing	Count	8	0	2	10
		% within industry sector that is most appropriate to the company	80.0%	.0%	20.0%	100.0%
	service	Count	38	2	1	41
		% within industry sector that is most appropriate to the company	92.7%	4.9%	2.4%	100.0%
Total		Count	46	2	3	51
		% within industry sector that is most appropriate to the company	90.2%	3.9%	5.9%	100.0%



**Appendix 5.13 Manufacturing vs. Service Firms: ICT network**  
the PC network in the company \* industry sector that is most appropriate to the company Crosstabulation

			industry sector that is most appropriate to the company		
			manufacturing	service	Total
the PC network in the company	Unlinked PCs	Count	5	8	13
		% within industry sector that is most appropriate to the company	50.0%	19.5%	25.5%
	Linked PCs (LAN)	Count	3	27	30
		% within industry sector that is most appropriate to the company	30.0%	65.9%	58.8%
	Wide Area Network (WAN)	Count	2	6	8
		% within industry sector that is most appropriate to the company	20.0%	14.6%	15.7%
Total	Count	10	41	51	
	% within industry sector that is most appropriate to the company	100.0%	100.0%	100.0%	

**Appendix 5.14 Manufacturing vs. Service Firms: Internet connection**

industry sector that is most appropriate to the company \* a method is used to connect the Internet Crosstabulation

			a method is used to connect the			Total
			broadband	ISDN	Dial-up Internet connection	
industry sector that is most appropriate to the company	manufacturing	Count	8	1	0	9
		% within industry sector that is most appropriate to the company	88.9%	11.1%	.0%	100.0%
	service	Count	39	1	1	41
		% within industry sector that is most appropriate to the company	95.1%	2.4%	2.4%	100.0%
Total	Count	47	2	1	50	
	% within industry sector that is most appropriate to the company	94.0%	4.0%	2.0%	100.0%	

## Appendix 5.15 Manufacturing vs. Service Firms: communication tools

			mainly using phone and fax to communicate with the employees, customers, suppliers and partners		Total
			yes	no	
industry sector that is most appropriate to the company	manufacturing	Count % within industry sector that is most appropriate to the company	9 90.0%	1 10.0%	10 100.0%
	service	Count % within industry sector that is most appropriate to the company	32 78.0%	9 22.0%	41 100.0%
Total		Count % within industry sector that is most appropriate to the company	41 80.4%	10 19.6%	51 100.0%

**Table 5.15.1 industry sector that is most appropriate to the company \* mainly using phone communicate with their employees, customers, suppliers and and fax to partners Crosstabulation**

			mainly using email to communicate with the employees, customers, suppliers and partners		Total
			yes	no	
industry sector that is most appropriate to the company	manufacturing	Count % within industry sector that is most appropriate to the company	9 90.0%	1 10.0%	10 100.0%
	service	Count % within industry sector that is most appropriate to the company	38 92.7%	3 7.3%	41 100.0%
Total		Count % within industry sector that is most appropriate to the company	47 92.2%	4 7.8%	51 100.0%

**Table 5.15.2 industry sector that is most appropriate to the company \* mainly using email to communicate with their employees, customers, suppliers and partners Crosstabulation**

			mainly using Intranet and extranet to communicate with the employees, customers, suppliers and partners		Total
			yes	no	
industry sector that is most appropriate to the company	manufacturing	Count % within industry sector that is most appropriate to the company	1 10.0%	9 90.0%	10 100.0%
	service	Count % within industry sector that is most appropriate to the company	7 17.1%	34 82.9%	41 100.0%
Total		Count % within industry sector that is most appropriate to the company	8 15.7%	43 84.3%	51 100.0%

**Table 5.15.3 industry sector that is most appropriate to the company \* mainly using Intranet and extranet to communicate with their employees, customers, suppliers and partners Crosstabulation**

**Appendix 5.16 Manufacturing vs. Service Firms: business priority**

			the company want to improve Communication in their business by using e-business		Total
			yes	no	
industry sector that is most appropriate to the company	manufacturing	Count % within industry sector that is most appropriate to the company	7 70.0%	3 30.0%	10 100.0%
	service	Count % within industry sector that is most appropriate to the company	27 65.9%	14 34.1%	41 100.0%
Total		Count % within industry sector that is most appropriate to the company	34 66.7%	17 33.3%	51 100.0%

**Table 5.16.1 industry sector that is most appropriate to the company \* the company want to improve communication in their business by using e-business Crosstabulation**

			the company want to improve Collaboration in their business by using e-business		Total
			yes	no	
industry sector that is most appropriate to the company	manufacturing	Count % within industry sector that is most appropriate to the company	3 30.0%	7 70.0%	10 100.0%
	service	Count % within industry sector that is most appropriate to the company	6 14.6%	35 85.4%	41 100.0%
Total		Count % within industry sector that is most appropriate to the company	9 17.6%	42 82.4%	51 100.0%

**Table 5.16.2 industry sector that is most appropriate to the company \* the company want to improve Collaboration in their business by using e-business Crosstabulation**

			the company want to improve Marketing in their business by using e-business		Total
			yes	no	
industry sector that is most appropriate to the company	manufacturing	Count % within industry sector that is most appropriate to the company	6 60.0%	4 40.0%	10 100.0%
	service	Count % within industry sector that is most appropriate to the company	28 68.3%	13 31.7%	41 100.0%
Total		Count % within industry sector that is most appropriate to the company	34 66.7%	17 33.3%	51 100.0%

**Table 5.16.3 industry sector that is most appropriate to the company \* the company want to improve Marketing in their business by using e-business Crosstabulation**

			the company want to improve Purchasing in their business by using e-business		Total
			yes	no	
industry sector that is most appropriate to the company	manufacturing	Count % within industry sector that is most appropriate to the company	2 20.0%	8 80.0%	10 100.0%
	service	Count % within industry sector that is most appropriate to the company	4 9.8%	37 90.2%	41 100.0%
Total		Count % within industry sector that is most appropriate to the company	6 11.8%	45 88.2%	51 100.0%

**Table 5.16.4 industry sector that is most appropriate to the company \* the company want to improve Purchasing in their business by using e-business Crosstabulation**

			the company want to improve Sales in their business by using e-business		Total
			yes	no	
industry sector that is most appropriate to the company	manufacturing	Count % within industry sector that is most appropriate to the company	6 60.0%	4 40.0%	10 100.0%
	service	Count % within industry sector that is most appropriate to the company	24 58.5%	17 41.5%	41 100.0%
Total		Count % within industry sector that is most appropriate to the company	30 58.8%	21 41.2%	51 100.0%

**Table 5.16.5 industry sector that is most appropriate to the company \* the company want to improve Sales in their business by using e-business Crosstabulation**

			the company want to improve Resource Management in their business by using e-business		Total
			yes	no	
industry sector that is most appropriate to the company	manufacturing	Count % within industry sector that is most appropriate to the company	0 .0%	10 100.0%	10 100.0%
	service	Count % within industry sector that is most appropriate to the company	3 7.3%	38 92.7%	41 100.0%
Total		Count % within industry sector that is most appropriate to the company	3 5.9%	48 94.1%	51 100.0%

**Table 5.16.6 industry sector that is most appropriate to the company \* the company want to improve Resource Management in their business by using e-business Crosstabulation**

			the company want to improve Customer Service in their business by using e-business		Total
			yes	no	
industry sector that is most appropriate to the company	manufacturing	Count % within industry sector that is most appropriate to the company	6 60.0%	4 40.0%	10 100.0%
	service	Count % within industry sector that is most appropriate to the company	24 58.5%	17 41.5%	41 100.0%
Total		Count % within industry sector that is most appropriate to the company	30 58.8%	21 41.2%	51 100.0%

**Table 5.16.7 industry sector that is most appropriate to the company \* the company want to improve Customer Service in their business by using e-business Crosstabulation**

**Appendix 5.17 Manufacturing vs. Service Firms: ICT skills**

			the company calls for support on an ad-hoc basis when they need to solve ICT problems		Total
			yes	no	
industry sector that is most appropriate to the company	manufacturing	Count % within industry sector that is most appropriate to the company	5 50.0%	5 50.0%	10 100.0%
	service	Count % within industry sector that is most appropriate to the company	9 22.0%	32 78.0%	41 100.0%
Total		Count % within industry sector that is most appropriate to the company	14 27.5%	37 72.5%	51 100.0%

**Table 5.17.1 industry sector that is most appropriate to the company \* the company calls for support on an ad-hoc basis when they need to solve ICT problems Crosstabulation**

			the company has in-house ICT staff/expertise to solve ICT problems		Total
			yes	no	
industry sector that is most appropriate to the company	manufacturing	Count % within industry sector that is most appropriate to the company	4 40.0%	6 60.0%	10 100.0%
	service	Count % within industry sector that is most appropriate to the company	23 56.1%	18 43.9%	41 100.0%
Total		Count % within industry sector that is most appropriate to the company	27 52.9%	24 47.1%	51 100.0%

**Table 5.17.2 industry sector that is most appropriate to the company \* the company has in-house ICT staff/expertise to solve ICT problems Crosstabulation**

			the company calls for contracted external support to solve ICT problems		Total
			yes	no	
industry sector that is most appropriate to the company	manufacturing	Count % within industry sector that is most appropriate to the company	2 20.0%	8 80.0%	10 100.0%
	service	Count % within industry sector that is most appropriate to the company	17 41.5%	24 58.5%	41 100.0%
Total		Count % within industry sector that is most appropriate to the company	19 37.3%	32 62.7%	51 100.0%

**Table 5.17.3 industry sector that is most appropriate to the company \* the company calls for contracted external support to solve ICT problems Crosstabulation**

**Appendix 5.18 Manufacturing vs. Service Firms: mobile working ability**

			people in the company use mobile phone working remotely		Total
			yes	no	
industry sector that is most appropriate to the company	manufacturing	Count % within industry sector that is most appropriate to the company	9 90.0%	1 10.0%	10 100.0%
	service	Count % within industry sector that is most appropriate to the company	38 95.0%	2 5.0%	40 100.0%
Total		Count % within industry sector that is most appropriate to the company	47 94.0%	3 6.0%	50 100.0%

**Table 5.18.1 industry sector that is most appropriate to the company \* people in the company use mobile phone working remotely Crosstabulation**



			people in the company use Bluetooth devices working remotely		Total
			yes	no	
industry sector that is most appropriate to the company	manufacturing	Count % within industry sector that is most appropriate to the company	3 30.0%	7 70.0%	10 100.0%
	service	Count % within industry sector that is most appropriate to the company	13 33.3%	26 66.7%	39 100.0%
Total		Count % within industry sector that is most appropriate to the company	16 32.7%	33 67.3%	49 100.0%

**Table 5.18.2 industry sector that is most appropriate to the company \* people in the company use Bluetooth devices working remotely Crosstabulation**

			people in the company use PDA/laptops working remotely		Total
			yes	no	
industry sector that is most appropriate to the company	manufacturing	Count % within industry sector that is most appropriate to the company	6 60.0%	4 40.0%	10 100.0%
	service	Count % within industry sector that is most appropriate to the company	30 76.9%	9 23.1%	39 100.0%
Total		Count % within industry sector that is most appropriate to the company	36 73.5%	13 26.5%	49 100.0%

**Table 5.18.3 industry sector that is most appropriate to the company \* people in the company use PDA/laptops working remotely Crosstabulation**

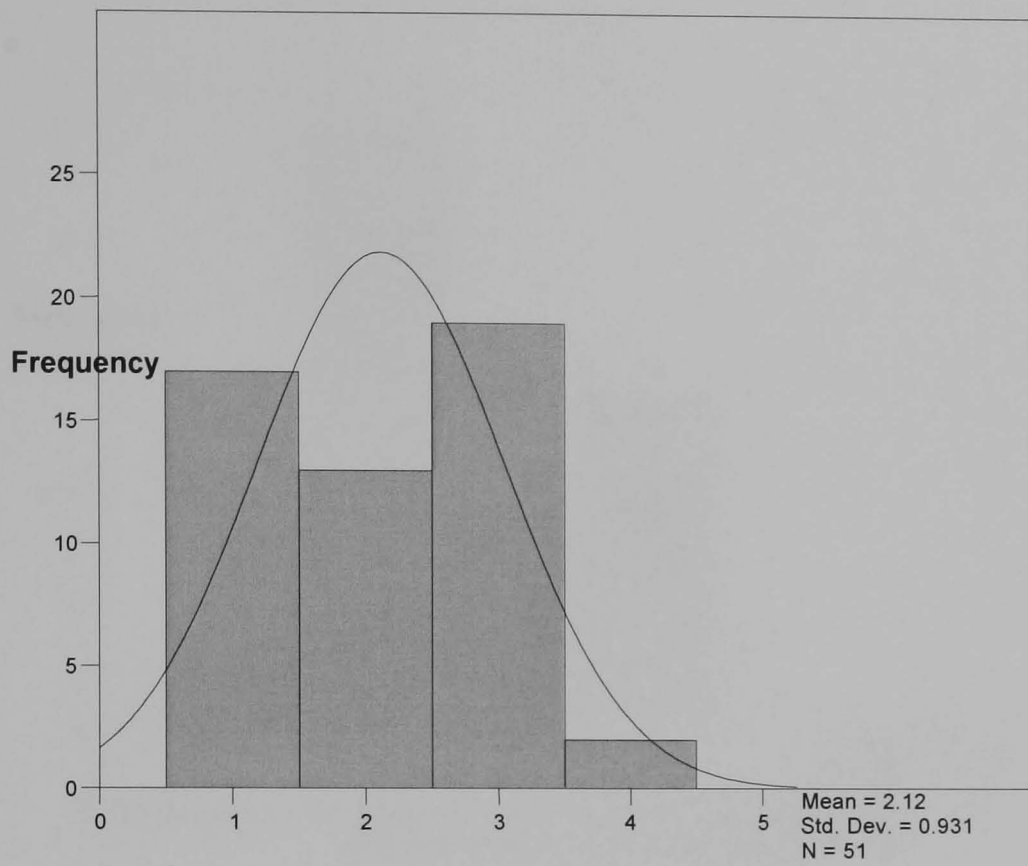
			people in the company use videoconference working remotely		Total
			yes	no	
industry sector that is most appropriate to the company	manufacturing	Count % within industry sector that is most appropriate to the company	1 10.0%	9 90.0%	10 100.0%
	service	Count % within industry sector that is most appropriate to the company	5 12.8%	34 87.2%	39 100.0%
Total		Count % within industry sector that is most appropriate to the company	6 12.2%	43 87.8%	49 100.0%

**Table 5.18.4 industry sector that is most appropriate to the company \* people in the company use videoconference working remotely Crosstabulation**

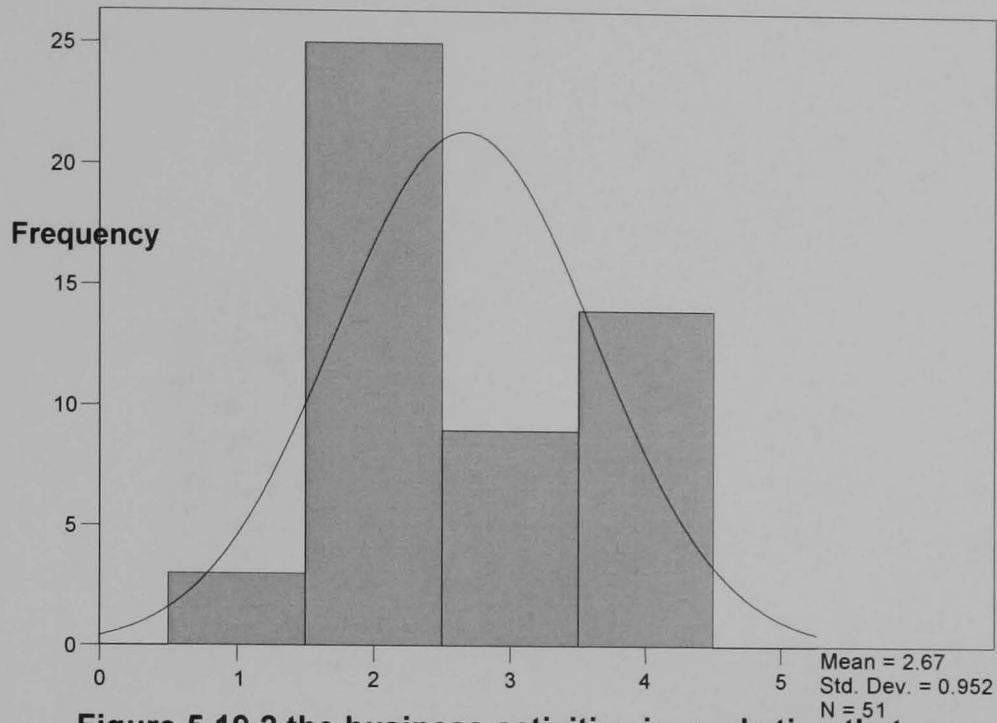
			people in the company use wireless devices working remotely		Total
			yes	no	
industry sector that is most appropriate to the company	manufacturing	Count % within industry sector that is most appropriate to the company	2 20.0%	8 80.0%	10 100.0%
	service	Count % within industry sector that is most appropriate to the company	18 46.2%	21 53.8%	39 100.0%
Total		Count % within industry sector that is most appropriate to the company	20 40.8%	29 59.2%	49 100.0%

**Table 5.18.5 industry sector that is most appropriate to the company \* people in the company use wireless devices working remotely Crosstabulation**

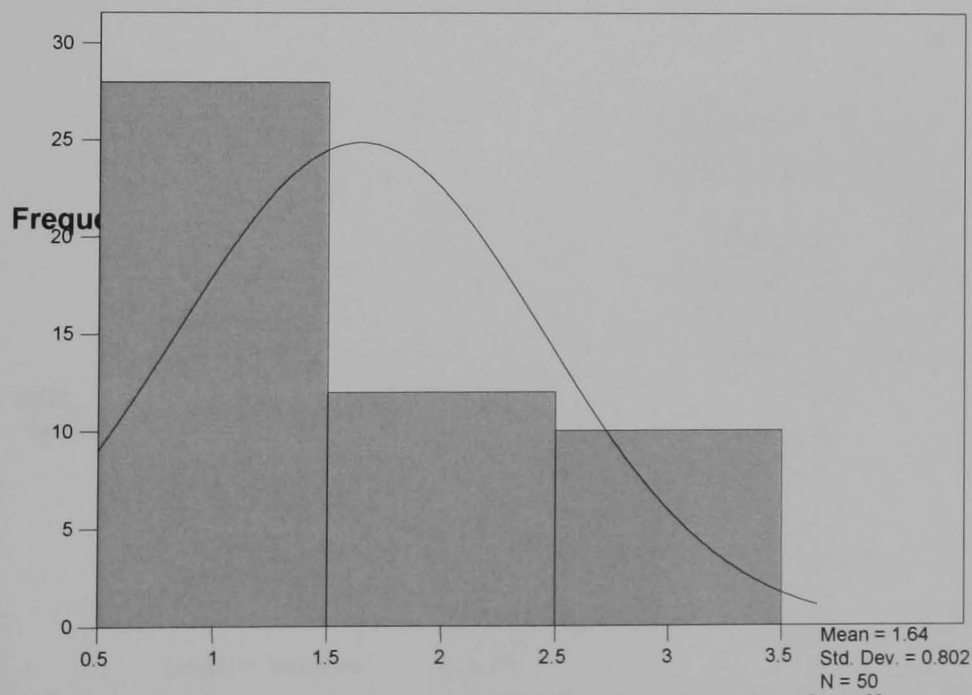
**Appendix 5.19 E-B/C level in each business area**



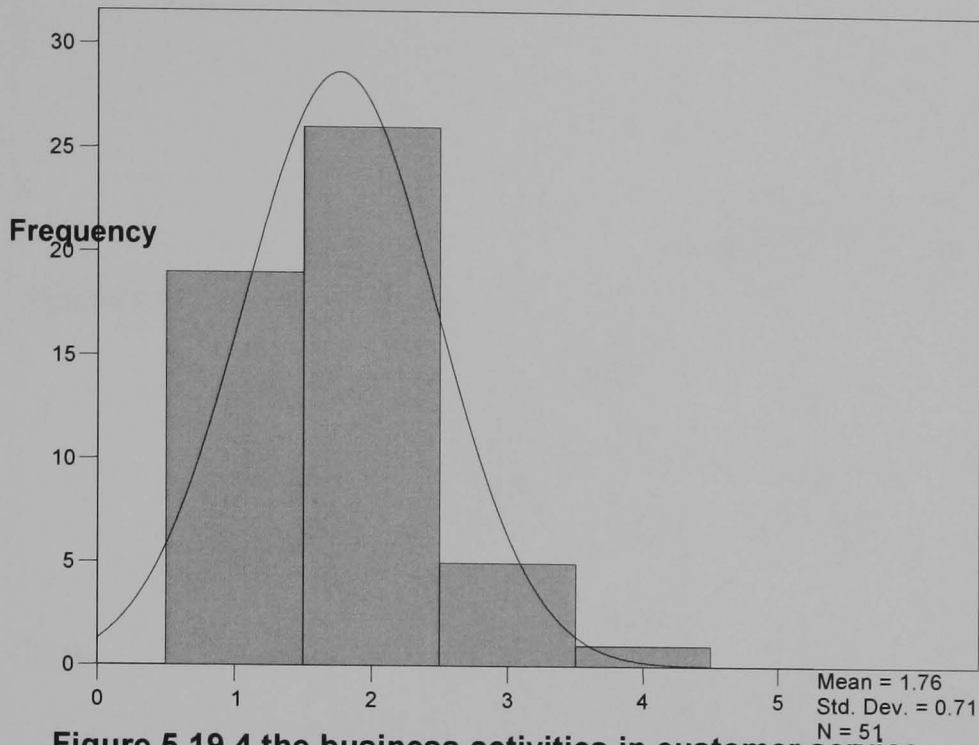
**Figure 5.19.1 the business activities in resource management that implies the level of e-activities in the business process**



**Figure 5.19.2 the business activities in marketing that implies the level of e-activities in the business process**



**Figure 5.19.3 the business activities in sales that implies the level of e-activities in the business process**



**Figure 5.19.4 the business activities in customer service that implies the level of e-activities in the business process**

**Appendix 5.20 E-B/C level in size and sector**

			the business activities in sales that implies level of e-activities in the business process			Total
			traditional approach to customer, level 1	online catalogue, traditional ways to take orders, level 2	order/modify orders and pay online, level 3	
Size Sector	small manufacturing	Count	3	3	1	7
		% within Size Sector	42.9%	42.9%	14.3%	100.0%
	medium manufacturing	Count	2	1	0	3
		% within Size Sector	66.7%	33.3%	.0%	100.0%
	small service	Count	16	7	6	29
		% within Size Sector	55.2%	24.1%	20.7%	100.0%
	medium service	Count	7	1	3	11
		% within Size Sector	63.6%	9.1%	27.3%	100.0%
Total		Count	28	12	10	50
		% within Size Sector	56.0%	24.0%	20.0%	100.0%

**Table 5.20.1 Small vs. Medium and service vs. manufacturing: the business activities in sales that implies the level of e-activities in the business process Crosstabulation**

		the business activities in purchasing implies the level of e-activities in the business process			Total
		traditional purchasing, level 1	online sourcing but traditional payment, level 2	Sourcing & payment online, level 3	
SizeSector small manufacturing	Count	4	2	1	7
	% within SizeSector	57.1%	28.6%	14.3%	100.0%
medium manufacturing	Count	1	1	1	3
	% within SizeSector	33.3%	33.3%	33.3%	100.0%
small service	Count	12	9	9	30
	% within SizeSector	40.0%	30.0%	30.0%	100.0%
Medium service	Count	9	0	1	10
	% within SizeSector	90.0%	.0%	10.0%	100.0%
Total	Count	26	12	12	50
	% within SizeSector	52.0%	24.0%	24.0%	100.0%

**Table 5.20.2 Small vs. Medium and service vs. manufacturing: the business activities in purchasing that implies the level of e-activities in the business process Crosstabulation**

		the business activities in marketing that implies the level of e-activities in the business process				Total
		no marketing activities, level 1	some traditional marketing activities, level 2	online marketing activities, level 3	both online and offline marketing activities, level 4	
SizeSector small manufacturing	Count	1	4	1	1	7
	% within SizeSector	14.3%	57.1%	14.3%	14.3%	100.0%
medium manufacturing	Count	1	2	0	0	3
	% within SizeSector	33.3%	66.7%	.0%	.0%	100.0%
small service	Count	1	13	8	8	30
	% within SizeSector	3.3%	43.3%	26.7%	26.7%	100.0%
medium service	Count	0	6	0	5	11
	% within SizeSector	.0%	54.5%	.0%	45.5%	100.0%
Total	Count	3	25	9	14	51
	% within SizeSector	5.9%	49.0%	17.6%	27.5%	100.0%

**Table 5.20.3 Small vs. Medium and service vs. manufacturing: the business activities in marketing that implies the level of e-activities in the business process Crosstabulation**

		the business activities in customer service that implies the level of e-activities in the business process					
		customer service within office hour, level 1	offline and online customer service, level 2	personalised customer Service level 3	online communities level 4	Total	
SizeSector	small manufacturing	Count	2	3	2	0	7
		% within SizeSector	28.6%	42.9%	28.6%	.0%	100.0%
	large manufacturing	Count	1	2	0	0	3
		% within SizeSector	33.3%	66.7%	.0%	.0%	100.0%
small service	Count	10	16	3	1	30	
		% within SizeSector	33.3%	53.3%	10.0%	3.3%	100.0%
large service	Count	6	5	0	0	11	
		% within SizeSector	54.5%	45.5%	.0%	.0%	100.0%
Total	Count	19	26	5	1	51	
		% within SizeSector	37.3%	51.0%	9.8%	2.0%	100.0%

**Table 5.20.4 Small vs. Medium and service vs. manufacturing: the business activities in customer service that implies the level of e- activities in the business process Crosstabulation**

		the business activities in resource management that implies the level of e-activities in the business process					
		no resource management activities, level 1	some resource management activities, level 2	regularly resource management activities level 3	electronic resource management system, level 4	Total	
SizeSector	small manufacturing	Count	2	1	4	0	7
		% within SizeSector	28.6%	14.3%	57.1%	.0%	100.0%
	large manufacturing	Count	0	1	2	0	3
		% within SizeSector	.0%	33.3%	66.7%	.0%	100.0%
small service	Count	12	7	9	2	30	
		% within SizeSector	40.0%	23.3%	30.0%	6.7%	100.0%
large service	Count	3	4	4	0	11	
		% within SizeSector	27.3%	36.4%	36.4%	.0%	100.0%
Total	Count	17	13	19	2	51	
		% within SizeSector	33.3%	25.5%	37.3%	3.9%	100.0%

**Table 5.20.5 Small vs. Medium and service vs. manufacturing: SizeSector \* the business activities in resource management that implies the level of e-activities in the business process Crosstabulation**

### Appendix 5.21 Paired Samples Test (Summary)

Appendix 22	<u>Mean Difference</u>	<b>PS (Paired Samples Test)</b>
<b><u>Awareness vs. Practice</u></b>	+0.02	<i>t(df), Sig. (p)/significant difference</i>
P1: have a clear e-b/c goal and vision	+0.32	t(49)=2.461, p= 0.017/p<0.05 <b>Yes*</b>
P2: have e-b/c priorities based on business needs	+0.10	t(49)=1.5, p=0.14/p>0.05 No
P3: have full awareness of e-b/c benefits	+0.28	t(49)=1.885, p=0.065/p>0.05 No
P4: have full awareness of e-b/c regulations & laws	+0.44	t(48)=2.542, p=0.014/p<0.05 <b>Yes*</b>
P5: quick response to customers' needs via e-b/c	+0.26	t(47)=2.052, p=0.046/p<0.05 <b>Yes*</b>
P6: collaboratively sharing business activities online	+0.18	t(48)=2.685, p=0.01/p<0.05 <b>Yes*</b>
P7: survey employee & evaluate e-b/c impact online	+0.10	t(49)=2.271, p=0.028/p<0.05 <b>Yes*</b>
P8: budget on every e-b/c project	+0.47	t(49)=1.323, p=0.192/p>0.05 No
P9: constantly review ICT strategy	+0.15	t(49)=1.46, p=0.151/p>0.05 No
P10: sharing information electronically	+0.20	t(48)=2.203, p=0.032/p<0.05 <b>Yes*</b>
P11: use online training for staff development	+0.25	t(49)=2.098, p=0.041/p<0.05 <b>Yes*</b>
P12: define & deliver security/privacy policies to all	+0.33	t(48)=1.359, p=0.181/p>0.05 No
P13: control different levels of access authority	+0.26	t(49)=1.093, p=0.28/p>0.05 No
P14: provide a secure & reliable system for all users	+0.40	t(48)=0.299, p=0.766/p>0.05 No
P15: Q30 can work remotely	<u>+0.49</u>	t(49)=1.093, p=0.28/p>0.05 No

**Yes\* presents there is significantly difference between e-b/c awareness and practice at p<0.05 level**



## Appendix 5.22 Paired-samples t-test: Descriptive Statistics

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	how important for a SME to have a clear e-B/C goal and vision of what to do next	3.58	50	1.144	.162
	how good the company at having a clear e-B/C goal and vision of what to do next	3.14	50	1.195	.169
Pair 2	how important for a SME to be always prooritize e-B/C activities based on business needs	3.52	50	1.389	.196
	how good the company at prioritizing e-B/C activities based on business needs	3.26	50	1.175	.166
Pair 3	how important for a SME to be aware of e-B/C benefits that bring to business	3.74	50	1.139	.161
	how good the company at having e-B/C benefits awareness	3.46	50	1.092	.154
Pair 4	how important for a SME to be aware of e-B/C relevant regulations and laws	3.39	49	1.204	.172
	how good the company at having awareness of e-B/C regulations and laws	2.92	49	1.134	.162
Pair 5	how important fir a SME to respond customer needs quickly through e-B/C systems	3.88	48	1.315	.190
	how good the company at responding customer needs quickly through e-B/C systems	3.56	48	1.367	.197
Pair 6	how important for a SME to collaborate by sharing business activities online with trading partners	3.06	49	1.376	.197
	how good the company at collaborating by sharing business activities online with trading partners	2.73	49	1.169	.167
Pair 7	how important for a SME to be survey employees and trading partners to evaluate e-B/C impact on them	2.52	50	1.403	.198
	how good the company at surveying employees and trading partners to evaluate e-B/C impact on them	2.12	50	1.256	.178
Pair 8	how important for a SME to budget on every e-B/C project	3.48	50	1.460	.207
	how good the company at budgeting on every e-B/C project	3.30	50	1.446	.205

**Paired Samples Statistics**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 9	how important for a SME to constantly review information technology strategy	3.34	50	1.465	.207
	how good the company at reviewing information technology strategy	3.14	50	1.385	.196
Pair 10	how important for a SME to empower people through information sharing electronically	3.33	49	1.231	.176
	how good the company at empowering people through information sharing electronically	3.08	49	1.288	.184
Pair 11	how important for a SME to use online training for staff development	2.58	50	1.500	.212
	how good the company at training online for staff development	2.32	50	1.421	.201
Pair 12	how important for a SME to deliver security/privacy policies to all parties involved	3.37	49	1.302	.186
	how good the company at delivering security/privacy policies to all parties involved	3.22	49	1.343	.192
Pair 13	how important for a SME to control different levels of authority to access the company's data systems	3.80	50	1.229	.174
	how good the company at controlling data access	3.70	50	1.165	.165
Pair 14	how important for a SME to provide a secure, private and reliable system for their business and all users	4.08	49	.997	.142
	how good the company at providing a secure, private and reliable system for their business and all users	4.06	49	.988	.141
Pair 15	how important for a SME to work remotely	3.46	50	1.373	.194
	how good the company at working remotely	3.36	50	1.367	.193

## Paired Samples Test (significant test results)

		Paired Samples Test					t	df	Sig. (2-tailed)
		Paired Differences							
		Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference				
Lower	Upper								
Pair 1	how important for a SME to have a clear e-B/C goal and vision of what to do next - how good the company at having a clear e-B/C goal and vision of what to do next	.440	1.264	.179	.081	.799	2.461	49	.017
Pair 2	how important for a SME to be always prooritize e-B/C activities based on business needs - how good the company at proritizing e-B/C activities based on business needs	.260	1.226	.173	-.088	.608	1.500	49	.140
Pair 3	how important for a SME to be aware of e-B/C benefits that bring to business - how good the company at having e-B/C benefits awareness	.280	1.051	.149	-.019	.579	1.885	49	.065
Pair 4	how important for a SME to be aware of e-B/C relevant regulations and laws - how good the company at having awareness of e-B/C regulations and laws	.469	1.293	.185	.098	.841	2.542	48	.014
Pair 5	how important fir a SME to respond customer needs quickly through e-B/C systems - how good the company at responding customer needs quickly through e-B/C systems	.313	1.055	.152	.006	.619	2.052	47	.046
Pair 6	how important for a SME to collaborate by sharing business activities online with trading partners - how good the company at collaborating by sharing business activities online with trading partners	.327	.851	.122	.082	.571	2.685	48	.010
Pair 7	how important for a SME to be survey employees and trading partners to evaluate e-B/C impact on them - how good the company at surveying employees and trading partners to evaluate e-B/C impact on them	.400	1.245	.176	.046	.754	2.271	49	.028
Pair 8	how important for a SME to budget on every e-B/C project - how good the company at budgeting on every e-B/C project	.180	.962	.136	-.093	.453	1.323	49	.192

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 9	how important for a SME to constantly review information technology strategy - how good the company at reviewing information technology strategy	.200	.969	.137	-.075	.475	1.460	49	.151
Pair 10	how important for a SME to empower people through information sharing electronically - how good the company at empowering people through information sharing electronically	.245	.778	.111	.021	.468	2.203	48	.032
Pair 11	how important for a SME to use online training for staff development - how good the company at training online for staff development	.260	.876	.124	.011	.509	2.098	49	.041
Pair 12	how important for a SME to deliver security/privacy policies to all parties involved - how good the company at delivering security/privacy policies to all parties involved	.143	.736	.105	-.069	.354	1.359	48	.181
Pair 13	how important for a SME to control different levels of authority to access the company's data systems - how good the company at controlling data access	.100	.647	.091	-.084	.284	1.093	49	.280
Pair 14	how important for a SME to provide a secure, private and reliable system for their business and all users - how good the company at providing a secure, private and reliable system for their business and all users	.020	.478	.068	-.117	.158	.299	48	.766
Pair 15	how important for a SME to work remotely - how good the company at working remotely	.100	.647	.091	-.084	.284	1.093	49	.280

**Appendix 5.23: Independent-sample t-test: summarised results (part 1: mean difference in e-b/c awareness)**

<b>Hypotheses for Independent T-test:</b>								
No There was no statistically significant difference in sores for users and none users of users of each listed subject if p value presented in sig. (2-tailed) column is >0.05. <b>Yes*</b> There was statistically significant difference in sores for users and none users of each listed subject if presented in sig. (2-tailed) column is <b>≤0.05</b> . (95% confidence)								
<b>Subject:</b>	<b><u>website</u></b>		<b><u>ad-hoc</u></b>		<b><u>in-house ICT staff</u></b>		<b><u>Wireless</u></b>	
<b>Appendix</b>	5.24		5.25		5.26		5.27	
<b>Outputs:</b>	<b>Mean Difference</b>	<b>Sig. (2-tailed)</b>	<b>Mean Difference</b>	<b>Sig. (2-tailed)</b>	<b>Mean Difference</b>	<b>Sig. (2-tailed)</b>	<b>Mean Difference</b>	<b>Sig. (2-tailed)</b>
Q16:have a clear e-b/c goal and vision	+0.976	<b>0.002 Yes*</b>	-0.882	<b>0.012 Yes*</b>	+0.681	<b>0.031 Yes</b>	+0.928	<b>0.005 Yes</b>
Q17:have e-b/c priorities based on needs	+0.910	<b>0.021 Yes*</b>	-0.120	<b>0.018 Yes*</b>	+1.000	<b>0.009 Yes</b>	+1.436	<b>0.000 Yes</b>
Q18:have full awareness of e-b/c benefits	+0.886	<b>0.005 Yes*</b>	-0.660	0.065 No	+0.579	0.070 No	+0.836	<b>0.012 Yes</b>
Q19:have full awareness of e-b/c regulations & laws	+0.617	0.073 No	-0.098	0.802 No	+0.221	0.520 No	+0.179	0.621 No
Q20:quick response to customers' needs via e-b/c	+0.964	<b>0.009 Yes*</b>	-0.566	0.181 No	+0.097	0.798 No	+0.919	<b>0.017 Yes</b>
Q21:collaboratively sharing business activities online	+0.976	<b>0.012 Yes*</b>	-1.130	<b>0.010 Yes*</b>	+0.853	<b>0.029 Yes</b>	+1.083	<b>0.006 Yes</b>
Q22:survey employee & evaluate e-b/c impact online	+0.745	0.063 No	-0.821	<b>0.036 Yes*</b>	+0.760	0.055 No	+1.164	<b>0.003 Yes</b>
Q23:budget on every e-b/c project	+1.471	<b>0.001 Yes*</b>	-0.865	0.059 No	+0.763	0.064 No	+0.500	0.250 No
Q24:constantly review ICT strategy	+1.056	<b>0.010 Yes*</b>	-1.464	<b>0.001 Yes*</b>	+1.295	<b>0.001 Yes</b>	+1.879	<b>0.000 Yes</b>
Q25:sharing information electronically	+0.929	<b>0.008 Yes*</b>	-1.282	<b>0.001 Yes*</b>	+1.107	<b>0.001 Yes</b>	+0.974	<b>0.006 Yes</b>
Q26:use online training for staff development	+0.560	1.176 No	-1.599	<b>0.000 Yes*</b>	+0.795	0.060 No	+0.543	0.220 No
Q27:define & deliver security/privacy policies to all	+1.153	<b>0.002 Yes*</b>	-1.338	<b>0.001 Yes*</b>	+0.774	<b>0.036 Yes</b>	+1.335	<b>0.000 Yes</b>
Q28:control different levels of access authority	+0.099	0.783 No	-1.111	<b>0.003 Yes*</b>	+0.256	0.467 No	+0.936	<b>0.007 Yes</b>
Q29:provide a secure & reliable system for all users	+0.690	<b>0.015 Yes*</b>	-1.158	<b>0.000 Yes*</b>	+0.564	<b>0.047Yes</b>	+0.909	<b>0.001 Yes</b>
Q30:can work remotely	+1.095	<b>0.004 Yes*</b>	-1.433	<b>0.001 Yes*</b>	+1.205	<b>0.001Yes</b>	+1.029	<b>0.010 Yes</b>

## Appendix 5.24 Website vs. e-b/c awareness

### Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
how important to have a clear e-B/C goals and vision of what to do next	Equal variances assumed	5.811	.020	3.307	49	.002	.976	.295	.383	1.569
	Equal variances not assumed			3.539	48.955	.001	.976	.276	.422	1.531
how important to have e-b/c priority based on business needs	Equal variances assumed	9.339	.004	2.394	48	.021	.910	.380	.146	1.674
	Equal variances not assumed			2.566	47.350	.014	.910	.355	.197	1.623
how important to be aware of e-B/C benefits that bring to business	Equal variances assumed	2.003	.163	2.925	49	.005	.886	.303	.277	1.494
	Equal variances not assumed			3.059	48.408	.004	.886	.290	.304	1.468
how important to be aware of e-B/C relevant regulations and laws	Equal variances assumed	.509	.479	1.833	48	.073	.617	.336	-.060	1.293
	Equal variances not assumed			1.910	45.965	.062	.617	.323	-.033	1.267
how important to respond quickly through e-b/c systems	Equal variances assumed	9.436	.004	2.735	47	.009	.964	.353	.255	1.674
	Equal variances not assumed			2.953	43.865	.005	.964	.327	.306	1.622
how important to share business activities online with trading partners	Equal variances assumed	1.341	.253	2.602	47	.012	.976	.375	.221	1.731
	Equal variances not assumed			2.672	46.424	.010	.976	.365	.241	1.712
how important to evaluate e-b/c impact on employees and trading partners	Equal variances assumed	.448	.507	1.903	48	.063	.745	.392	-.042	1.533
	Equal variances not assumed			1.865	39.847	.070	.745	.400	-.063	1.554
how important to budget on every e-b/c project	Equal variances assumed	.745	.392	4.025	48	.000	1.471	.366	.736	2.206
	Equal variances not assumed			4.058	44.475	.000	1.471	.363	.741	2.202
how important to constantly review information technology strategy	Equal variances assumed	2.272	.138	2.667	48	.010	1.056	.396	.260	1.852
	Equal variances not assumed			2.762	47.405	.008	1.056	.382	.287	1.825
how important to empower people through information sharing electronically	Equal variances assumed	.218	.642	2.791	47	.008	.929	.333	.259	1.598
	Equal variances not assumed			2.818	44.656	.007	.929	.330	.265	1.592
how important to use online training for staff development	Equal variances assumed	1.069	.306	1.313	48	.196	.560	.427	-.298	1.418
	Equal variances not assumed			1.275	38.324	.210	.560	.439	-.329	1.449
how important to deliver security policies to all parties involved	Equal variances assumed	9.816	.003	3.358	47	.002	1.153	.343	.462	1.844
	Equal variances not assumed			3.719	44.957	.001	1.153	.310	.529	1.778
how important to control different levels to access the firm's data systems	Equal variances assumed	.211	.648	.277	48	.783	.099	.355	-.616	.813
	Equal variances not assumed			.275	41.952	.785	.099	.358	-.625	.822
how important to provide a secure, and reliable system for their business	Equal variances assumed	5.334	.025	2.532	47	.015	.690	.273	.142	1.239
	Equal variances not assumed			2.795	39.162	.008	.690	.247	.191	1.190
how important to work remotely	Equal variances assumed	1.270	.265	3.002	48	.004	1.095	.365	.362	1.829
	Equal variances not assumed			3.150	47.967	.003	1.095	.348	.396	1.794

## Appendix 5.25 ICT skills (using ad-hoc) vs. e-b/c awareness

### Independent Samples Test

		Levene's Test for Equality of Variance		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
how important for a SME to have a clear e-B/C goal and vision of what to do next	Equal variances assumed	7.755	.008	-2.616	49	.012	-.882	.337	-1.560	-.205
	Equal variances not assumed			-2.138	17.070	.047	-.882	.413	-1.752	-.012
how important for a SME to be always prioritize e-B/C activities based on business needs	Equal variances assumed	2.902	.095	-2.448	48	.018	-1.020	.417	-1.858	-.182
	Equal variances not assumed			-2.180	19.303	.042	-1.020	.468	-1.998	-.042
how important for a SME to be aware of e-B/C benefits that bring to business	Equal variances assumed	.082	.776	-1.890	49	.065	-.660	.349	-1.362	.042
	Equal variances not assumed			-1.863	22.851	.075	-.660	.354	-1.394	.073
how important for a SME to be aware of e-B/C relevant regulations and laws	Equal variances assumed	2.993	.090	-.252	48	.802	-.098	.388	-.879	.683
	Equal variances not assumed			-.216	16.733	.831	-.098	.451	-1.051	.856
how important for a SME to respond customer needs quickly through e-B/C systems	Equal variances assumed	6.217	.016	-1.357	47	.181	-.566	.417	-1.406	.273
	Equal variances not assumed			-1.135	16.202	.273	-.566	.499	-1.622	.490
how important for a SME to collaborate by sharing business activities online with trading partners	Equal variances assumed	1.203	.278	-2.701	47	.010	-1.130	.418	-1.972	-.288
	Equal variances not assumed			-2.881	24.183	.008	-1.130	.392	-1.940	-.321
how important for a SME to be survey employees and trading partners to evaluate e-B/C impact on	Equal variances assumed	.092	.763	-2.160	48	.036	-.921	.426	-1.778	-.063
	Equal variances not assumed			-2.108	22.648	.046	-.921	.437	-1.825	-.017
how important for a SME to budget on every e-B/C project	Equal variances assumed	.733	.396	-1.933	48	.059	-.865	.448	-1.765	.035
	Equal variances not assumed			-1.820	21.177	.083	-.865	.475	-1.853	.123
how important for a SME to constantly review information technology strategy	Equal variances assumed	.242	.625	-3.523	48	.001	-1.464	.416	-2.300	-.628
	Equal variances not assumed			-3.336	21.406	.003	-1.464	.439	-2.376	-.553
how important for a SME to empower people through information sharing electronically	Equal variances assumed	.826	.368	-3.595	47	.001	-1.282	.357	-1.999	-.565
	Equal variances not assumed			-3.284	18.268	.004	-1.282	.390	-2.101	-.463
how important for a SME to use online training for staff development	Equal variances assumed	5.084	.029	-3.829	48	.000	-1.599	.418	-2.439	-.759
	Equal variances not assumed			-4.603	36.504	.000	-1.599	.347	-2.303	-.895
how important for a SME to deliver security/privacy policies to all parties involved	Equal variances assumed	1.405	.242	-3.534	47	.001	-1.338	.378	-2.099	-.576
	Equal variances not assumed			-3.250	18.459	.004	-1.338	.412	-2.201	-.474
how important for a SME to control different levels of authority to access the company's data systems	Equal variances assumed	.850	.361	-3.115	48	.003	-1.111	.357	-1.828	-.394
	Equal variances not assumed			-2.847	20.125	.010	-1.111	.390	-1.925	-.297
how important for a SME to provide a secure, private and reliable system for their business	Equal variances assumed	25.633	.000	-4.156	47	.000	-1.158	.279	-1.719	-.597
	Equal variances not assumed			-2.858	13.312	.013	-1.158	.405	-2.031	-.285
how important for a SME to work remotely	Equal variances assumed	1.032	.315	-3.720	48	.001	-1.433	.385	-2.207	-.658
	Equal variances not assumed			-4.134	30.032	.000	-1.433	.346	-2.140	-.725

## Appendix 5.26 ICT skills (in-house ICT expertise) vs. e-b/c awareness

### Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
how important to have a clear e-B/C goals and vision of what to do next	Equal variances assumed	21.433	.000	2.218	49	.031	.681	.307	.064	1.297
	Equal variances not assumed			2.138	32.691	.040	.681	.318	.033	1.328
how important to have e-b/c priorities based on business needs	Equal variances assumed	7.960	.007	2.703	48	.009	1.000	.370	.256	1.744
	Equal variances not assumed			2.659	39.118	.011	1.000	.376	.239	1.761
how important to be aware of e-B/C benefits that bring to business	Equal variances assumed	5.474	.023	1.850	49	.070	.579	.313	-.050	1.207
	Equal variances not assumed			1.824	43.498	.075	.579	.317	-.061	1.218
how important to be aware of e-B/C relevant regulations and laws	Equal variances assumed	2.351	.132	.648	48	.520	.221	.341	-.464	.906
	Equal variances not assumed			.635	41.173	.529	.221	.348	-.481	.923
how important to respond customer Needs quickly through e-b/c systems	Equal variances assumed	.892	.350	.258	47	.798	.097	.376	-.660	.854
	Equal variances not assumed			.256	44.139	.799	.097	.379	-.667	.861
how important to share business activities online with trading partners	Equal variances assumed	5.005	.030	2.256	47	.029	.853	.378	.092	1.613
	Equal variances not assumed			2.206	38.231	.033	.853	.387	.070	1.635
how important to evaluate e-b/c Impact on employees and trading partners	Equal variances assumed	.391	.535	1.968	48	.055	.760	.386	-.017	1.536
	Equal variances not assumed			1.954	45.066	.057	.760	.389	-.023	1.543
how important to budget on every e-b/c project	Equal variances assumed	2.646	.110	1.894	48	.064	.763	.403	-.047	1.573
	Equal variances not assumed			1.879	44.754	.067	.763	.406	-.055	1.581
how important to constantly review information technology strategy	Equal variances assumed	11.681	.001	3.452	48	.001	1.295	.375	.541	2.049
	Equal variances not assumed			3.390	37.918	.002	1.295	.382	.522	2.068
how important to empower people through information sharing electronically	Equal variances assumed	2.791	.101	3.487	47	.001	1.107	.317	.468	1.746
	Equal variances not assumed			3.418	39.449	.001	1.107	.324	.452	1.762
how important to use online training for staff development	Equal variances assumed	.672	.416	1.924	48	.060	.795	.413	-.036	1.626
	Equal variances not assumed			1.917	46.718	.061	.795	.415	-.039	1.629
how important to deliver security policies to all parties involved	Equal variances assumed	3.961	.052	2.155	47	.036	.774	.359	.051	1.497
	Equal variances not assumed			2.10	37.778	.042	.774	.368	.029	1.519
how important to control different levels to access the firm's data systems	Equal variances assumed	.001	.971	.734	48	.467	.256	.350	-.446	.959
	Equal variances not assumed			.737	47.978	.465	.256	.348	-.443	.956
how important to provide a secure, and reliable system for their business	Equal variances assumed	1.493	.228	2.039	47	.047	.564	.276	.008	1.119
	Equal variances not assumed			2.008	41.459	.051	.564	.281	-.003	1.130
how important to work remotely	Equal variances assumed	.106	.747	3.422	48	.001	1.205	.352	.497	1.913
	Equal variances not assumed			3.415	47.223	.001	1.205	.353	.495	1.915



## Appendix 5.27 Wireless vs. e-b/c awareness

### Independent Samples Test

		Levene's Test for Equality of Variance		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
how important to have a clear e-B/C goals and vision of what to do next	Equal variances assumed	10.904	.002	2.979	47	.005	.928	.311	.301	1.554
	Equal variances not assumed			3.277	45.709	.002	.928	.283	.358	1.498
how important to have e-b/c priority based on business needs	Equal variances assumed	7.562	.008	4.040	46	.000	1.436	.355	.720	2.151
	Equal variances not assumed			4.402	44.301	.000	1.436	.326	.778	2.093
how important to be aware of e-B/C benefits that bring to business	Equal variances assumed	.214	.645	2.617	47	.012	.836	.319	.193	1.479
	Equal variances not assumed			2.603	40.221	.013	.836	.321	.187	1.485
how important to be aware of e-B/C relevant regulations and laws	Equal variances assumed	1.239	.271	.498	46	.621	.179	.359	-.544	.901
	Equal variances not assumed			.512	44.667	.611	.179	.349	-.524	.881
how important to respond customer needs quickly through e-b/c systems	Equal variances assumed	5.620	.022	2.469	45	.017	.919	.372	.169	1.668
	Equal variances not assumed			2.602	44.883	.013	.919	.353	.208	1.630
how important to share business activities online with trading partners	Equal variances assumed	1.388	.245	2.908	45	.006	1.083	.373	.333	1.834
	Equal variances not assumed			2.995	44.442	.004	1.083	.362	.354	1.812
how important to evaluate e-b/c Impact on employees and trading partners	Equal variances assumed	1.860	.179	3.091	46	.003	1.164	.377	.406	1.923
	Equal variances not assumed			3.012	37.047	.005	1.164	.387	.381	1.948
how important to budget on every e-b/c project	Equal variances assumed	4.510	.039	1.164	46	.250	.500	.430	-.365	1.365
	Equal variances not assumed			1.213	45.571	.231	.500	.412	-.330	1.330
how important to constantly review information technology strategy	Equal variances assumed	15.092	.000	5.536	46	.000	1.879	.339	1.195	2.562
	Equal variances not assumed			6.145	41.554	.000	1.879	.306	1.261	2.496
how important to empower people through information sharing electronically	Equal variances assumed	1.418	.240	2.868	45	.006	.974	.340	.290	1.658
	Equal variances not assumed			2.985	44.942	.005	.974	.326	.317	1.631
how important to use online training for staff development	Equal variances assumed	3.403	.072	1.244	46	.220	.543	.436	-.336	1.421
	Equal variances not assumed			1.197	35.036	.239	.543	.453	-.378	1.463
how important to deliver security policies to all parties involved	Equal variances assumed	2.762	.103	3.965	45	.000	1.335	.337	.657	2.013
	Equal variances not assumed			4.150	45.000	.000	1.335	.322	.687	1.983
how important to control different levels to access the firm's data systems	Equal variances assumed	1.451	.235	2.804	46	.007	.936	.334	.264	1.607
	Equal variances not assumed			2.870	44.107	.006	.936	.326	.279	1.593
how important to provide a secure, and reliable system for their business	Equal variances assumed	3.259	.078	3.560	45	.001	.909	.255	.395	1.424
	Equal variances not assumed			3.929	38.736	.000	.909	.231	.441	1.377
how important to work remotely	Equal variances assumed	.088	.768	2.704	46	.010	1.029	.380	.263	1.794
	Equal variances not assumed			2.683	39.917	.011	1.029	.383	.254	1.803

**Appendix 5.28: Independent-sample t-test: summarised results (part 2: mean difference in e-b/c good practice)**

<b>Hypotheses for Independent T-test:</b>								
No There was no statistically significant difference in sores for users and none users of users of each listed subject if p value presented in sig. (2-tailed) column is above 0.05.								
Yes*There was statistically significant difference in sores for users and none users of each listed subject if p value presented in sig. (2-tailed) column is ≤ 0.05 (95% confidence).								
<b>Subject:</b>	<b>website</b>		<b>ad-hoc</b>		<b>in-house ICT staff</b>		<b>Wireless</b>	
<b>Appendix</b>	5.29		5.30		5.31		5.32	
<b>Outputs:</b>	<b>Mean Difference</b>	<b>Sig. (2-tailed)</b>	<b>Mean Difference</b>	<b>Sig. (2-tailed)</b>	<b>Mean Difference</b>	<b>Sig. (2-tailed)</b>	<b>Mean Difference</b>	<b>Sig. (2-tailed)</b>
Q16:have a clear e-b/c goal and vision	+0.850	<b>0.012 Yes*</b>	-0.085	0.828 No	+0.179	0.603 No	+0.179	0.617 No
Q17:have e-b/c priorities based on needs	+0.455	0.179 No	-0.460	0.217 No	+0.340	0.312 No	+0.529	0.129 No
Q18:have full awareness of e-b/c benefits	+0.733	<b>0.018 Yes*</b>	-0.242	0.487 No	+0.288	0.358 No	+0.392	0.227 No
Q19:have full awareness of e-b/c regulations & laws	+0.053	0.873 No	-0.308	0.407 No	+0.829	<b>0.009 Yes</b>	+0.459	0.179 No
Q20:quick response to customers' needs via e-b/c	+0.693	0.081 No	-0.306	0.508 No	+0.031	0.938 No	-0.719	0.083 No
Q21:collaboratively sharing business activities online	+0.764	<b>0.023 Yes*</b>	-0.476	0.204 No	+0.385	0.255 No	+0.586	0.096 No
Q22:survey employee & evaluate e-b/c impact online	+0.368	0.312 No	-1.060	<b>0.006 Yes*</b>	+1.112	<b>0.001 Yes</b>	+0.457	0.216 No
Q23:budget on every e-b/c project	+1.207	<b>0.003 Yes*</b>	-0.417	0.366 No	+0.417	0.314 No	+0.629	0.144 No
Q24:constantly review ICT strategy	+1.072	<b>0.006 Yes*</b>	-1.187	<b>0.005 Yes*</b>	+1.071	<b>0.005 Yes</b>	+1.293	<b>0.001 Yes</b>
Q25:sharing information electronically	+1.024	<b>0.005 Yes*</b>	-1.158	<b>0.004 Yes*</b>	+1.383	<b>0.000 Yes</b>	+0.772	<b>0.044 Yes</b>
Q26:use online training for staff development	+1.008	<b>0.012 Yes*</b>	-1.635	<b>0.000 Yes*</b>	+1.096	<b>0.005 Yes</b>	+1.007	<b>0.014 Yes</b>
Q27:define & deliver security/privacy policies to all	+1.479	<b>0.000 Yes*</b>	-1.143	<b>0.007 Yes*</b>	+0.505	0.192 No	+0.898	<b>0.023 Yes</b>
Q28:control different levels of access authority	+0.435	0.195 No	-0.774	<b>0.033 Yes*</b>	+0.064	0.848 No	+0.821	<b>0.010 Yes</b>
Q29:provide a secure & reliable system for all users	+0.726	<b>0.009 Yes*</b>	-0.816	<b>0.009 Yes*</b>	+0.361	0.205 No	+0.268	<b>0.014 Yes</b>
Q30:can work remotely	+1.021	<b>0.008 Yes*</b>	-1.095	<b>0.009 Yes*</b>	+0.993	<b>0.014 Yes</b>	+1.207	<b>0.002 Yes</b>

Appendix 5.29

Website vs. e-b/c good practice

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
how good the firm having a clear e-B/C goal and vision of what to do next	Equal variances assumed	1.259	.267	2.604	48	.012	.850	.326	.194	1.506
	Equal variances not assumed			2.675	44.377	.010	.850	.318	.210	1.490
how good the firm have e-B/C priority based on business needs	Equal variances assumed	.881	.353	1.363	48	.179	.455	.334	-.216	1.126
	Equal variances not assumed			1.391	46.067	.171	.455	.327	-.203	1.113
how good the firm aware of e-B/C benefits	Equal variances assumed	4.354	.042	2.441	48	.018	.733	.300	.129	1.337
	Equal variances not assumed			2.590	47.355	.013	.733	.283	.164	1.303
how good the firm having awareness of e-B/C regulations and laws	Equal variances assumed	.297	.589	.161	47	.873	.053	.333	-.616	.723
	Equal variances not assumed			.167	45.707	.868	.053	.320	-.591	.698
how good to respond customer' needs needs quickly via e-B/C systems	Equal variances assumed	.017	.898	1.783	46	.081	.693	.389	-.089	1.476
	Equal variances not assumed			1.776	42.479	.083	.693	.390	-.094	1.481
how good to share business activities online with trading partners	Equal variances assumed	.191	.664	2.356	48	.023	.764	.324	.112	1.415
	Equal variances not assumed			2.369	44.099	.022	.764	.322	.114	1.413
how good to evaluate e-b/c Impact on employees and trading parnters	Equal variances assumed	1.601	.212	1.023	48	.312	.368	.360	-.355	1.091
	Equal variances not assumed			.992	38.026	.328	.368	.371	-.383	1.119
how good to budget on every e-B/C project	Equal variances assumed	.086	.771	3.170	48	.003	1.207	.381	.441	1.972
	Equal variances not assumed			3.112	40.226	.003	1.207	.388	.423	1.990
how good to reviw information technology strategy	Equal variances assumed	.218	.643	2.898	48	.006	1.072	.370	.328	1.816
	Equal variances not assumed			2.942	45.409	.005	1.072	.364	.338	1.806
how good to empower people through information sharing electronically	Equal variances assumed	.003	.955	2.968	47	.005	1.024	.345	.330	1.718
	Equal variances not assumed			2.967	43.153	.005	1.024	.345	.328	1.720
how good to train staff online for development	Equal variances assumed	2.849	.098	2.621	48	.012	1.008	.385	.235	1.782
	Equal variances not assumed			2.509	35.771	.017	1.008	.402	.193	1.823
how good to deliver security/privacy policies to all parties involved	Equal variances assumed	6.721	.013	4.481	47	.000	1.479	.330	.815	2.143
	Equal variances not assumed			4.82	46.938	.000	1.479	.307	.863	2.096
how good to control different levels of data access	Equal variances assumed	.319	.575	1.313	48	.195	.435	.331	-.231	1.101
	Equal variances not assumed			1.340	46.043	.187	.435	.325	-.218	1.089
how good to provide a secure and reliable system for all	Equal variances assumed	.739	.394	2.710	47	.009	.726	.268	.187	1.265
	Equal variances not assumed			2.839	46.946	.007	.726	.256	.212	1.241
how good the firm working remotely	Equal variances assumed	1.002	.322	2.782	48	.008	1.021	.367	.283	1.760
	Equal variances not assumed			2.854	46.630	.006	1.021	.358	.301	1.741

## Appendix 5.30 ICT skills (using ad-hoc) vs. e-b/c good practice

### Independent Samples Test

		Levene's Test for Equality of Variance		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
how good the firm having a clear e-B/C goal and vision of what to do next	Equal variances assumed	1.123	.295	-0.219	48	.828	-.085	.389	-.868	.697
	Equal variances not assumed			-0.206	19.013	.839	-.085	.413	-.951	.780
how good the firm having e-b/c priorities based on business needs	Equal variances assumed	2.871	.097	-1.251	48	.217	-.460	.368	-1.200	.279
	Equal variances not assumed			-1.152	20.361	.263	-.460	.400	-1.293	.372
how good the firm having e-B/C benefits awareness	Equal variances assumed	2.011	.163	-.700	48	.487	-.242	.346	-.937	.453
	Equal variances not assumed			-.638	20.022	.531	-.242	.379	-1.033	.549
how good the firm having awareness of e-B/C regulations and laws	Equal variances assumed	.073	.789	-.836	47	.407	-.308	.368	-1.048	.432
	Equal variances not assumed			-.785	19.068	.442	-.308	.392	-1.128	.513
how good the firm responding customer needs quickly through e-B/C systems	Equal variances assumed	.217	.643	-.667	46	.508	-.306	.458	-1.228	.617
	Equal variances not assumed			-.647	18.010	.526	-.306	.472	-1.297	.686
how good the firm to share business activities online with trading partners	Equal variances assumed	2.745	.104	-1.287	48	.204	-.476	.370	-1.220	.268
	Equal variances not assumed			-1.538	35.950	.133	-.476	.310	-1.104	.152
how good the firm to evaluate e-b/c impact on employees and trading partners	Equal variances assumed	13.797	.001	-2.870	48	.006	-1.060	.369	-1.802	-.317
	Equal variances not assumed			-3.822	45.602	.000	-1.060	.277	-1.618	-.501
how good the firm at budgeting on every e-b/c project	Equal variances assumed	1.405	.242	-.913	48	.366	-.417	.456	-1.334	.501
	Equal variances not assumed			-.851	20.797	.405	-.417	.490	-1.436	.602
how good the firm at reviewing information technology strategy	Equal variances assumed	.530	.470	-2.921	48	.005	-1.187	.406	-2.003	-.370
	Equal variances not assumed			-2.725	20.834	.013	-1.187	.435	-2.092	-.281
how good the firm at empowering people through information sharing electronically	Equal variances assumed	.808	.373	-3.001	47	.004	-1.158	.386	-1.935	-.382
	Equal variances not assumed			-3.045	21.875	.006	-1.158	.380	-1.947	-.369
how good the firm at training online for staff development	Equal variances assumed	20.898	.000	-4.240	48	.000	-1.635	.386	-2.410	-.860
	Equal variances not assumed			-5.988	47.998	.000	-1.635	.273	-2.184	-1.086
how good the firm at delivering security policies to all parties involved	Equal variances assumed	.088	.768	-2.815	47	.007	-1.143	.406	-1.960	-.326
	Equal variances not assumed			-2.716	19.967	.013	-1.143	.421	-2.021	-.265
how good the firm at controlling data access	Equal variances assumed	3.573	.065	-2.189	48	.033	-.774	.354	-1.485	-.063
	Equal variances not assumed			-1.883	18.311	.076	-.774	.411	-1.636	.088
how good the firm at providing a secure and reliable system for all	Equal variances assumed	17.881	.000	-2.719	47	.009	-.816	.300	-1.420	-.212
	Equal variances not assumed			-2.024	14.263	.062	-.816	.403	-1.680	.047
how good the firm at working remotely	Equal variances assumed	.004	.952	-2.703	48	.009	-1.095	.405	-1.910	-.281
	Equal variances not assumed			-2.788	25.314	.010	-1.095	.393	-1.904	-.287

## Appendix 5.31 ICT skills (in-house ICT expert) vs. e-b/c good practice

### Independent Samples Test

		Levene's Test for Equality of Variance		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
how good the firm at having a clear e-B/C goal and vision of what to do next	Equal variances assumed	3.709	.060	.523	48	.603	.179	.342	-.508	.866
	Equal variances not assumed			.510	39.415	.613	.179	.351	-.530	.888
how good the firm at having e-B/C priority based on business needs	Equal variances assumed	11.536	.001	1.022	48	.312	.340	.332	-.329	1.008
	Equal variances not assumed			1.005	38.567	.321	.340	.338	-.344	1.024
how good the firm at having e-B/C benefits awareness	Equal variances assumed	1.540	.221	.929	48	.358	.288	.310	-.336	.912
	Equal variances not assumed			.917	43.551	.364	.288	.314	-.345	.922
how good the firm at having awareness of e-B/C regulations and laws	Equal variances assumed	.002	.964	2.722	47	.009	.829	.305	.216	1.443
	Equal variances not assumed			2.716	45.893	.009	.829	.305	.215	1.444
how good the firm at responding customer needs quickly through e-B/C systems	Equal variances assumed	.055	.816	.079	46	.938	.031	.400	-.774	.837
	Equal variances not assumed			.079	45.448	.937	.031	.398	-.770	.833
how good the firm at sharing business activities online with trading partners	Equal variances assumed	1.822	.183	1.153	48	.255	.385	.334	-.286	1.055
	Equal variances not assumed			1.145	44.936	.258	.385	.336	-.292	1.061
how good the firm at evaluating e-b/c Impact on employees and trading partners	Equal variances assumed	5.454	.024	3.461	48	.001	1.112	.321	.466	1.758
	Equal variances not assumed			3.507	45.392	.001	1.112	.317	.474	1.751
how good the firm at budgeting on every e-b/c project	Equal variances assumed	3.141	.083	1.018	48	.314	.417	.409	-.406	1.240
	Equal variances not assumed			1.010	44.662	.318	.417	.412	-.414	1.248
how good the firm at reviewing information technology strategy	Equal variances assumed	1.873	.177	2.935	48	.005	1.071	.365	.337	1.804
	Equal variances not assumed			2.906	43.566	.006	1.071	.368	.328	1.813
how good the firm at empowering people through information sharing electronically	Equal variances assumed	.678	.414	4.413	47	.000	1.383	.313	.752	2.013
	Equal variances not assumed			4.366	43.256	.000	1.383	.317	.744	2.022
how good the firm at training online for staff development	Equal variances assumed	.043	.837	2.929	48	.005	1.096	.374	.344	1.849
	Equal variances not assumed			2.923	47.122	.005	1.096	.375	.342	1.851
how good the firm at delivering security policies to all parties involved	Equal variances assumed	5.986	.018	1.324	47	.192	.505	.381	-.262	1.272
	Equal variances not assumed			1.294	37.895	.204	.505	.390	-.285	1.295
how good the firm at controlling data access	Equal variances assumed	.001	.979	.192	48	.848	.064	.333	-.606	.734
	Equal variances not assumed			.193	47.789	.848	.064	.333	-.605	.733
how good the firm at providing a secure and reliable system for all	Equal variances assumed	.207	.651	1.286	47	.205	.361	.281	-.204	.926
	Equal variances not assumed			1.281	45.385	.207	.361	.282	-.206	.929
how good the firm at working remotely	Equal variances assumed	3.162	.082	2.542	48	.014	.933	.367	.195	1.671
	Equal variances not assumed			2.516	43.430	.016	.933	.371	.185	1.680

## Appendix 5.32 Wireless vs. e-b/c good practice

### Independent Samples Test

	Levene's Test for Equality of Variance		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
how good the company at having a clear e-B/C goal and vision of what to do next	3.628	.063	.503	46	.617	.179	.355	-.536	.893
			.526	45.730	.601	.179	.340	-.505	.862
how good the company at prioritizing e-B/C activities based on business needs	2.754	.104	1.547	46	.129	.529	.342	-.159	1.216
			1.612	45.580	.114	.529	.328	-.132	1.189
how good the company at having e-B/C benefits awareness	.000	.992	1.223	46	.227	.392	.320	-.253	1.037
			1.199	36.034	.238	.392	.327	-.271	1.055
how good the company at having awareness of e-B/C regulations and laws	.171	.682	1.367	45	.179	.459	.336	-.218	1.136
			1.393	43.531	.171	.459	.330	-.206	1.124
how good the company at responding customer needs quickly through e-B/C systems	.922	.342	1.776	44	.083	.719	.405	-.097	1.535
			1.802	42.897	.079	.719	.399	-.086	1.524
how good the company at collaborating by sharing business activities online with trading partners	.477	.493	1.697	46	.096	.586	.345	-.109	1.280
			1.730	43.658	.091	.586	.338	-.097	1.268
how good the company at surveying employees and trading partners to evaluate e-B/C impact on	.676	.415	1.255	46	.216	.457	.364	-.276	1.190
			1.286	44.238	.205	.457	.355	-.259	1.173
how good the company at budgeting on every e-B/C project	4.589	.037	1.486	46	.144	.629	.423	-.223	1.480
			1.552	45.705	.127	.629	.405	-.187	1.444
how good the company at reviewing information technology strategy	2.627	.112	3.470	46	.001	1.293	.373	.543	2.043
			3.627	45.720	.001	1.293	.356	.575	2.010
how good the company at empowering people through information sharing electronically	.508	.480	2.075	45	.044	.772	.372	.023	1.522
			2.105	43.058	.041	.772	.367	.033	1.512
how good the company at training online for staff development	3.220	.079	2.569	46	.014	1.007	.392	.218	1.796
			2.450	33.550	.020	1.007	.411	.171	1.843
how good the company at delivering security/privacy policies to all parties involved	1.775	.189	2.356	45	.023	.898	.381	.130	1.666
			2.438	44.732	.019	.898	.368	.156	1.640
how good the company at controlling data access	3.404	.071	2.675	46	.010	.821	.307	.203	1.440
			2.863	45.736	.006	.821	.287	.244	1.399
how good the company at providing a secure, private and reliable system for their business and all	3.613	.064	2.559	45	.014	.685	.268	.146	1.225
			2.768	42.431	.008	.685	.248	.186	1.185
how good the company at working remotely	.201	.656	3.285	46	.002	1.207	.367	.467	1.947
			3.287	41.183	.002	1.207	.367	.466	1.949

**Appendix 5.33: Independent-sample t-test: summarised results (part 3: Medium vs. small firms in mean difference of e-b/c good practice)**

<b>Hypotheses for Independent T-test:</b>									
No There was no statistically significant difference in mean scores for users and none users of each listed subject if p value presented in sig. (2-tailed) column is >0.05. Yes*There was statistically significant difference in scores for users and none users of each listed subject if presented in sig. (2-tailed) column is ≤0.05. (95% confidence).									
<b>Subject:</b>	<b><u>Website</u></b>		<b><u>Ad-hoc</u></b>		<b><u>in-house ICT staff</u></b>		<b><u>Wireless</u></b>		
<b>Outputs:</b>	<b>Large</b>	<b>Small</b>	<b>Large</b>	<b>Small</b>	<b>Large</b>	<b>Small</b>	<b>Large</b>	<b>Small</b>	
<b>Appendix:</b>	5.34	5.35	5.36	5.37	5.38	5.39	5.40	5.41	
Q16:have a clear e-b/c goal and vision	No	Yes*(p=0.023)	No	No	No	No	No	No	
Q17:have e-b/c priorities based on needs	No	No	No	Yes*(p=0.030)	No	No	No	Yes*(p=0.027)	
Q18:have full awareness of e-b/c benefits	No	Yes*(p=0.015)	No	No	No	No	No	No	
Q19:have full awareness of e-b/c regulations & laws	No	No	No	No	No	Yes*(p=0.021)	No	No	
Q20:quick response to customers' needs via e-b/c	No	No	No	No	No	Yes*(p=0.048)	No	Yes*(p=0.004)	
Q21:collaboratively sharing business activities online	No	Yes*(p=0.006)	No	No	No	No	No	No	
Q22:survey employee & evaluate e-b/c impact online	No	No	No	Yes*(p=0.006)	No	Yes*(p=0.004)	No	No	
Q23:budget on every e-b/c project	No	Yes*(p=0.002)	No	No	No	No	No	No	
Q24:constantly review ICT strategy	No	Yes*(p=0.009)	No	Yes*(p=0.003)	Yes	Yes*(p=0.013)	No	Yes*(p=0.001)	
Q25:sharing information electronically	No	Yes*(p=0.003)	No	Yes*(p=0.006)	No	Yes*(p=0.000)	No	Yes*(p=0.044)	
Q26:use online training for staff development	No	Yes*(p=0.006)	No	Yes*(p=0.000)	Yes	Yes*(p=0.029)	No	Yes*(p=0.027)	
Q27:define & deliver security/privacy policies to all	No	Yes*(p=0.000)	No	Yes*(p=0.001)	No	No	No	Yes*(p=0.005)	
Q28:control different levels of access authority	No	No	No	No	No	No	No	Yes*(p=0.008)	
Q29:provide a secure & reliable system for all users	No	Yes*(p=0.001)	No	Yes*(p=0.011)	No	No	No	Yes*(p=0.008)	
Q30:can work remotely	No	Yes*(p=0.007)	No	Yes*(p=0.010)	No	No	No	Yes*(p=0.006)	

## Appendix 5.34 Website impact on e-b/c good practice in medium firms

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
how good the company at having a clear e-B/C goal and vision of what to do next	Equal variances assumed	1.240	.287	.449	12	.661	.364	.810	-1.401	2.128
	Equal variances not assumed			.345	2.476	.758	.364	1.055	-3.436	4.163
how good the company at prioritizing e-B/C activities based on business needs	Equal variances assumed	.045	.836	-.369	11	.719	-.333	.902	-2.319	1.653
	Equal variances not assumed			-.341	2.984	.756	-.333	.978	-3.454	2.787
how good the company at having e-B/C benefits awareness	Equal variances assumed	.040	.845	-.283	12	.782	-.182	.641	-1.579	1.216
	Equal variances not assumed			-.280	3.146	.797	-.182	.649	-2.193	1.830
how good the company at having awareness of e-B/C regulations and laws	Equal variances assumed	.750	.407	.089	10	.931	.100	1.120	-2.395	2.595
	Equal variances not assumed			.091	1.457	.938	.100	1.100	-6.799	6.999
how good the company at responding customer needs quickly through e-B/C systems	Equal variances assumed	.965	.347	.588	11	.569	.667	1.134	-1.830	3.163
	Equal variances not assumed			.469	2.577	.676	.667	1.422	-4.310	5.643
how good the company at collaborating by sharing business activities online with trading partners	Equal variances assumed	.040	.846	-.174	11	.865	-.167	.955	-2.269	1.936
	Equal variances not assumed			-.168	3.148	.877	-.167	.992	-3.240	2.907
how good the company at surveying employees and trading partners to evaluate e-B/C impact on	Equal variances assumed	3.394	.093	.242	11	.813	.233	.964	-1.887	2.354
	Equal variances not assumed			.168	2.332	.880	.233	1.386	-4.986	5.453
how good the company at budgeting on every e-B/C project	Equal variances assumed	.125	.730	.266	11	.795	.233	.878	-1.699	2.166
	Equal variances not assumed			.240	2.913	.826	.233	.971	-2.911	3.377
how good the company at reviewing information technology strategy	Equal variances assumed	2.287	.159	.642	11	.534	.433	.675	-1.052	1.919
	Equal variances not assumed			.899	6.911	.399	.433	.482	-.709	1.576
how good the company at empowering people through information sharing electronically	Equal variances assumed	.073	.792	.411	11	.689	.333	.810	-1.450	2.117
	Equal variances not assumed			.430	3.548	.692	.333	.775	-1.930	2.596
how good the company at training online for staff development	Equal variances assumed	.057	.815	.041	11	.968	.033	.813	-1.755	1.822
	Equal variances not assumed			.035	2.733	.975	.033	.955	-3.181	3.248
how good the company at delivering security/privacy policies to all parties involved	Equal variances assumed	6.309	.029	.531	11	.606	.300	.565	-.943	1.543
	Equal variances not assumed			1.000	9.000	.343	.300	.300	-.379	.979
how good the company at controlling data access	Equal variances assumed	.037	.851	.000	11	1.000	.000	.561	-1.236	1.236
	Equal variances not assumed			.000	2.855	1.000	.000	.632	-2.072	2.072
how good the company at providing a secure, private and reliable system for their business and all	Equal variances assumed	.023	.881	-1.301	11	.220	-.533	.410	-1.436	.369
	Equal variances not assumed			-1.372	3.596	.249	-.533	.389	-1.662	.596
how good the company at working remotely	Equal variances assumed	.715	.416	.787	11	.448	.700	.890	-1.259	2.659
	Equal variances not assumed			.958	4.757	.384	.700	.731	-1.209	2.609



## Appendix 5.35 Website impact on e-b/c good practice in small firms

### Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
how good the firm at having a clear e-B/C goal and vision of what to do next	Equal variances assumed	3.282	.079	2.377	34	.023	.870	.366	.126	1.614
	Equal variances not assumed			2.420	32.709					
how good the firm at having e-b/c priority based on business needs	Equal variances assumed	2.237	.144	1.562	35	.127	.561	.359	-.168	1.291
	Equal variances not assumed			1.571	34.204					
how good the firm at having e-B/C benefits awareness	Equal variances assumed	10.999	.002	2.571	34	.015	.901	.350	.189	1.613
	Equal variances not assumed			2.642	29.780					
how good the firm at having awareness of e-B/C regulations and laws	Equal variances assumed	.070	.793	.140	35	.889	.050	.355	-.671	.770
	Equal variances not assumed			.141	34.749					
how good the firm at responding customer needs quickly through e-B/C systems	Equal variances assumed	.012	.913	1.440	33	.159	.588	.408	-.243	1.419
	Equal variances not assumed			1.443	32.998					
how good the firm at sharing business activities online with trading partners	Equal variances assumed	.000	.989	2.895	35	.006	.962	.332	.287	1.637
	Equal variances not assumed			2.894	34.828					
how good the firm at evaluating e-b/c impact on employees and trading partners	Equal variances assumed	.399	.532	1.096	35	.280	.439	.400	-.374	1.251
	Equal variances not assumed			1.093	34.074					
how good the firm at budgeting on every e-b/c project	Equal variances assumed	.028	.868	3.374	35	.002	1.480	.438	.589	2.370
	Equal variances not assumed			3.364	34.021					
how good the firm at reviewing information technology strategy	Equal variances assumed	.327	.571	2.754	35	.009	1.254	.456	.330	2.179
	Equal variances not assumed			2.763	34.841					
how good the firm at empowering people through information sharing electronically	Equal variances assumed	.232	.633	3.224	34	.003	1.278	.396	.472	2.083
	Equal variances not assumed			3.224	33.853					
how good the firm at training online for staff development	Equal variances assumed	2.923	.096	2.911	35	.006	1.316	.452	.398	2.233
	Equal variances not assumed			2.887	31.178					
how good the firm at delivering security/privacy policies to all parties involved	Equal variances assumed	14.672	.001	4.317	34	.000	1.715	.397	.908	2.523
	Equal variances not assumed			4.458	27.880					
how good the firm at controlling data access	Equal variances assumed	.766	.388	1.689	35	.100	.681	.403	-.138	1.500
	Equal variances not assumed			1.697	34.489					
how good the firm at providing a secure and reliable system for all	Equal variances assumed	4.957	.033	3.503	34	.001	1.111	.317	.467	1.756
	Equal variances not assumed			3.503	28.017					
how good the firm at working remotely	Equal variances assumed	.732	.398	2.886	35	.007	1.208	.418	.358	2.057
	Equal variances not assumed			2.894	34.956					

## Appendix 5.36 Ad-hoc impact on e-b/c good practice in medium firms

### Independent Samples Test

		Levene's Test for Equality of Variance		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
how good the firm at having a clear e-B/C goal and vision of what to do next	Equal variances assumed			1.118	12	.285	1.385	1.238	-1.313	4.082
	Equal variances not assumed						1.385			
how good the firm at having e-b/c priority based on business needs	Equal variances assumed			.838	11	.420	1.167	1.392	-1.896	4.230
	Equal variances not assumed						1.167			
how good the firm at having e-B/C benefits awareness	Equal variances assumed			.932	12	.370	.923	.990	-1.234	3.080
	Equal variances not assumed						.923			
how good the firm at responding customer needs quickly through e-B/C systems	Equal variances assumed			1.164	11	.269	2.000	1.719	-1.783	5.783
	Equal variances not assumed						2.000			
how good the firm at sharing business activities online with trading partners	Equal variances assumed			-.332	11	.746	-.500	1.505	-3.813	2.813
	Equal variances not assumed						-.500			
how good the firm at evaluating e-b/c impact on employees and trading partners	Equal variances assumed			-.844	11	.416	-1.250	1.480	-4.508	2.008
	Equal variances not assumed						-1.250			
how good the firm at budgeting on every e-b/c project	Equal variances assumed			1.593	11	.139	2.000	1.255	-.763	4.763
	Equal variances not assumed						2.000			
how good the firm at reviewing information technology strategy	Equal variances assumed			.000	11	1.000	.000	1.087	-2.393	2.393
	Equal variances not assumed						.000			
how good the firm at empowering people through information sharing electronically	Equal variances assumed			-.939	11	.368	-1.167	1.242	-3.901	1.567
	Equal variances not assumed						-1.167			
how good the firm at training online for staff development	Equal variances assumed			-1.169	11	.267	-1.417	1.212	-4.084	1.251
	Equal variances not assumed						-1.417			
how good the firm at delivering security policies to all parties involved	Equal variances assumed			.277	11	.787	.250	.901	-1.734	2.234
	Equal variances not assumed						.250			
how good the firm at controlling data access	Equal variances assumed			.000	11	1.000	.000	.888	-1.954	1.954
	Equal variances not assumed						.000			
how good the firm at providing a secure and reliable system for all	Equal variances assumed			-.120	11	.907	-.083	.696	-1.615	1.448
	Equal variances not assumed						-.083			
how good the firm at working remotely	Equal variances assumed			-.348	11	.735	-.500	1.438	-3.665	2.665
	Equal variances not assumed						-.500			

## Appendix 5.37 Ad-hoc impact on e-b/c good practice in small firms

### Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
how good the company at having a clear e-B/C goal and vision of what to do next	Equal variances assumed	2.309	.138	-1.115	34	.273	-.458	.411	-1.294	.377
	Equal variances not assumed			-1.029	18.056	.317	-.458	.446	-1.394	.478
how good the company at prioritizing e-B/C activities based on business needs	Equal variances assumed	8.323	.007	-2.256	35	.030	-.821	.364	-1.559	-.082
	Equal variances not assumed			-1.987	17.564	.063	-.821	.413	-1.689	.048
how good the company at having e-B/C benefits awareness	Equal variances assumed	2.936	.096	-1.427	34	.163	-.552	.387	-1.338	.234
	Equal variances not assumed			-1.325	20.099	.200	-.552	.417	-1.420	.317
how good the company at having awareness of e-B/C regulations and laws	Equal variances assumed	.979	.329	-.952	35	.348	-.349	.367	-1.094	.395
	Equal variances not assumed			-.878	19.743	.390	-.349	.398	-1.180	.481
how good the company at responding customer needs quickly through e-B/C systems	Equal variances assumed	1.650	.208	-1.795	33	.082	-.777	.433	-1.657	.104
	Equal variances not assumed			-1.629	15.709	.123	-.777	.477	-1.789	.236
how good the company at collaborating by sharing business activities online with trading partners	Equal variances assumed	.208	.651	-1.650	35	.108	-.615	.373	-1.373	.142
	Equal variances not assumed			-1.806	31.506	.081	-.615	.341	-1.310	.079
how good the company at surveying employees and trading partners to evaluate e-B/C impact on	Equal variances assumed	11.491	.002	-2.920	35	.006	-1.115	.382	-1.891	-.340
	Equal variances not assumed			-3.503	34.926	.001	-1.115	.318	-1.762	-.469
how good the company at budgeting on every e-B/C project	Equal variances assumed	.571	.455	-1.522	35	.137	-.779	.512	-1.818	.260
	Equal variances not assumed			-1.481	22.891	.152	-.779	.526	-1.867	.309
how good the company at reviewing information technology strategy	Equal variances assumed	.345	.561	-3.191	35	.003	-1.478	.463	-2.417	-.538
	Equal variances not assumed			-3.044	21.640	.006	-1.478	.485	-2.485	-.470
how good the company at empowering people through information sharing electronically	Equal variances assumed	.503	.483	-2.908	34	.006	-1.250	.430	-2.123	-.377
	Equal variances not assumed			-2.909	22.113	.008	-1.250	.430	-2.141	-.359
how good the company at training online for staff development	Equal variances assumed	22.611	.000	-4.193	35	.000	-1.804	.430	-2.678	-.931
	Equal variances not assumed			-5.299	32.243	.000	-1.804	.341	-2.498	-1.111
how good the company at delivering security/privacy policies to all parties involved	Equal variances assumed	.712	.405	-3.537	34	.001	-1.583	.448	-2.493	-.674
	Equal variances not assumed			-3.392	19.844	.003	-1.583	.467	-2.557	-.609
how good the company at controlling data access	Equal variances assumed	2.255	.142	-1.910	35	.064	-.798	.418	-1.647	.050
	Equal variances not assumed			-1.750	19.416	.096	-.798	.456	-1.751	.155
how good the company at providing a secure, private and reliable system for their business and all	Equal variances assumed	16.558	.000	-2.689	34	.011	-.958	.356	-1.683	-.234
	Equal variances not assumed			-2.172	13.734	.048	-.958	.441	-1.906	-.010
how good the company at working remotely	Equal variances assumed	.051	.823	-2.739	35	.010	-1.212	.442	-2.109	-.314
	Equal variances not assumed			-2.758	25.210	.011	-1.212	.439	-2.116	-.307

## Appendix 5.38 In-house ICT impact on good practice in medium firms

### Independent Samples Test

		Levene's Test for Equality of Variance		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
how good the firm at having a clear e-B/C goal and vision of what to do next	Equal variances assumed	.112	.744	.074	12	.942	.061	.816	-1.718	1.839
	Equal variances not assumed			.064	2.703	.954	.061	.952	-3.167	3.288
how good the firm at having e-B/C priority based on business needs	Equal variances assumed	1.186	.299	1.441	11	.177	1.200	.833	-.633	3.033
	Equal variances not assumed			1.129	2.539	.354	1.200	1.062	-2.556	4.956
how good the firm at having e-B/C benefits awareness	Equal variances assumed	.040	.845	.283	12	.782	.182	.641	-1.216	1.579
	Equal variances not assumed			.280	3.146	.797	.182	.649	-1.830	2.193
how good the firm at having awareness of e-B/C regulations and laws	Equal variances assumed	3.386	.096	1.730	10	.114	1.700	.983	-.490	3.890
	Equal variances not assumed			2.613	2.722	.088	1.700	.651	-.496	3.896
how good the firm at responding customer needs quickly through e-B/C systems	Equal variances assumed	.159	.698	-.203	11	.843	-.233	1.150	-2.764	2.298
	Equal variances not assumed			-.178	2.817	.871	-.233	1.312	-4.567	4.100
how good the firm at sharing business activities online with trading partners	Equal variances assumed	4.426	.059	1.729	11	.112	1.467	.848	-.400	3.334
	Equal variances not assumed			2.648	9.024	.026	1.467	.554	.214	2.719
how good the firm at evaluating e-b/c impact on employees and trading partners	Equal variances assumed	8.916	.012	1.757	11	.107	1.500	.854	-.379	3.379
	Equal variances not assumed			3.308	9.000	.009	1.500	.453	.474	2.526
how good the firm at budgeting on every e-b/c project	Equal variances assumed	.857	.374	.228	11	.824	.200	.879	-1.734	2.134
	Equal variances not assumed			.165	2.400	.882	.200	1.209	-4.254	4.654
how good the firm at reviewing information technology strategy	Equal variances assumed	.015	.904	2.301	11	.042	1.300	.565	.057	2.543
	Equal variances not assumed			2.053	2.870	.137	1.300	.633	-.768	3.368
how good the firm at empowering people through information sharing electronically	Equal variances assumed	.190	.671	2.003	11	.070	1.400	.699	-.138	2.938
	Equal variances not assumed			2.090	3.533	.114	1.400	.670	-.561	3.361
how good the firm at training online for staff development	Equal variances assumed	5.056	.046	2.695	11	.021	1.700	.631	.312	3.088
	Equal variances not assumed			5.075	9.000	.001	1.700	.335	.942	2.458
how good the firm at delivering security policies to all parties involved	Equal variances assumed	1.355	.269	1.038	11	.322	.567	.546	-.635	1.768
	Equal variances not assumed			.802	2.512	.491	.567	.706	-1.950	3.083
how good the firm at controlling data access	Equal variances assumed	1.077	.322	.794	11	.444	.433	.546	-.768	1.635
	Equal variances not assumed			1.000	5.166	.362	.433	.433	-.670	1.537
how good the firm at providing a secure and reliable system for all	Equal variances assumed	.023	.881	1.301	11	.220	.533	.410	-.369	1.436
	Equal variances not assumed			1.372	3.596	.249	.533	.389	-.596	1.662
how good the firm at working remotely	Equal variances assumed	.000	.986	1.832	11	.094	1.467	.801	-.295	3.229
	Equal variances not assumed			1.901	3.501	.140	1.467	.772	-.802	3.735

## Appendix 5.39 In-house ICT staff impact on e-b/c good practice in small firms

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
how good the company at having a clear e-B/C goal and vision of what to do next	Equal variances assumed	10.251	.003	1.189	34	.243	.463	.389	-328	1.253
	Equal variances not assumed			1.270	29.591	.214	.463	.364	-281	1.206
how good the company at prioritizing e-B/C activities based on business needs	Equal variances assumed	14.839	.000	.874	35	.388	.324	.371	-429	1.078
	Equal variances not assumed			.943	32.088	.353	.324	.344	-376	1.025
how good the company at having e-B/C benefits awareness	Equal variances assumed	3.130	.086	1.403	34	.170	.525	.374	-235	1.285
	Equal variances not assumed			1.443	33.990	.158	.525	.364	-215	1.265
how good the company at having awareness of e-B/C regulations and laws	Equal variances assumed	.465	.500	2.425	35	.021	.804	.331	.131	1.476
	Equal variances not assumed			2.491	34.751	.018	.804	.323	.149	1.459
how good the company at responding customer needs quickly through e-B/C systems	Equal variances assumed	.452	.506	.706	33	.485	.296	.419	-.557	1.149
	Equal variances not assumed			.709	32.443	.483	.296	.418	-.554	1.146
how good the company at collaborating by sharing business activities online with trading partners	Equal variances assumed	4.497	.041	.731	35	.470	.271	.370	-.481	1.023
	Equal variances not assumed			.771	34.508	.446	.271	.351	-.443	.984
how good the company at surveying employees and trading partners to evaluate e-B/C impact on	Equal variances assumed	1.769	.192	3.113	35	.004	1.131	.363	.393	1.869
	Equal variances not assumed			3.012	27.825	.005	1.131	.375	.362	1.900
how good the company at budgeting on every e-B/C project	Equal variances assumed	1.611	.213	1.186	35	.244	.592	.499	-.421	1.606
	Equal variances not assumed			1.206	34.112	.236	.592	.491	-.406	1.590
how good the company at reviewing information technology strategy	Equal variances assumed	.708	.406	2.604	35	.013	1.208	.464	.266	2.150
	Equal variances not assumed			2.667	34.597	.012	1.208	.453	.288	2.129
how good the company at empowering people through information sharing electronically	Equal variances assumed	1.232	.275	4.137	34	.000	1.538	.372	.782	2.293
	Equal variances not assumed			4.269	33.910	.000	1.538	.360	.806	2.269
how good the company at training online for staff development	Equal variances assumed	.259	.614	2.278	35	.029	1.080	.474	.117	2.043
	Equal variances not assumed			2.275	32.301	.030	1.080	.475	.113	2.047
how good the company at delivering security/privacy policies to all parties involved	Equal variances assumed	7.939	.008	1.591	34	.121	.763	.479	-.211	1.736
	Equal variances not assumed			1.660	33.203	.106	.763	.459	-.172	1.697
how good the company at controlling data access	Equal variances assumed	.107	.746	-.395	35	.695	-.167	.422	-1.024	.691
	Equal variances not assumed			-.391	31.352	.698	-.167	.426	-1.035	.701
how good the company at providing a secure, private and reliable system for their business and all	Equal variances assumed	.000	.987	.953	34	.348	.350	.367	-.397	1.097
	Equal variances not assumed			.947	31.541	.351	.350	.370	-.403	1.103
how good the company at working remotely	Equal variances assumed	3.616	.065	1.926	35	.062	.860	.447	-.047	1.767
	Equal variances not assumed			2.006	34.984	.053	.860	.429	-.010	1.731

## Appendix 5.40 Wireless impact on e-b/c good practice in medium firms

### Independent Samples Test

		Levene's Test for Equality of Variance		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
how good the firm at having a clear e-B/C goal and vision of what to do next	Equal variances assumed	.792	.391	-.309	12	.763	-.208	.674	-1.678	1.261
	Equal variances not assumed			-.294	8.709	.776	-.208	.708	-1.819	1.402
how good the firm at having e-B/C priority based on business needs	Equal variances assumed	2.716	.128	.255	11	.803	.200	.784	-1.525	1.925
	Equal variances not assumed			.226	5.819	.829	.200	.885	-1.981	2.381
how good the firm at having e-B/C benefits awareness	Equal variances assumed	1.125	.310	-.078	12	.939	-.042	.533	-1.204	1.121
	Equal variances not assumed			-.083	11.908	.935	-.042	.503	-1.138	1.055
how good the firm at having awareness of e-B/C regulations and laws	Equal variances assumed	.161	.697	.724	10	.486	.625	.863	-1.299	2.549
	Equal variances not assumed			.643	4.622	.551	.625	.972	-1.936	3.186
how good the firm at responding customer needs quickly through e-B/C systems	Equal variances assumed	1.647	.226	-.075	11	.941	-.075	.997	-2.270	2.120
	Equal variances not assumed			-.070	6.879	.946	-.075	1.068	-2.610	2.460
how good the firm at sharing business activities online with trading partners	Equal variances assumed	.215	.652	.941	11	.367	.750	.797	-1.004	2.504
	Equal variances not assumed			.855	6.294	.424	.750	.877	-1.373	2.873
how good the firm at evaluating e-b/c impact on employees and trading partners	Equal variances assumed	.366	.557	.703	11	.497	.575	.819	-1.227	2.377
	Equal variances not assumed			.728	9.627	.484	.575	.790	-1.194	2.344
how good the firm at budgeting on every e-b/c project	Equal variances assumed	.079	.784	-.098	11	.923	-.075	.762	-1.753	1.603
	Equal variances not assumed			-.094	7.478	.927	-.075	.796	-1.934	1.784
how good the firm at reviewing information technology strategy	Equal variances assumed	.246	.630	1.156	11	.272	.650	.562	-.588	1.888
	Equal variances not assumed			1.086	7.020	.313	.650	.599	-.764	2.064
how good the firm at empowering people through information sharing electronically	Equal variances assumed	.092	.767	.648	11	.530	.450	.694	-1.077	1.977
	Equal variances not assumed			.630	7.868	.546	.450	.714	-1.201	2.101
how good the firm at training online for staff development	Equal variances assumed	.001	.975	1.253	11	.236	.825	.658	-.624	2.274
	Equal variances not assumed			1.279	9.199	.232	.825	.645	-.630	2.280
how good the firm at delivering security policies to all parties involved	Equal variances assumed	2.481	.144	.563	11	.585	.275	.488	-.800	1.350
	Equal variances not assumed			.493	5.611	.641	.275	.558	-1.114	1.664
how good the firm at controlling data access	Equal variances assumed	1.536	.241	.000	11	1.000	.000	.486	-1.070	1.070
	Equal variances not assumed			.000	10.364	1.000	.000	.455	-1.009	1.009
how good the firm at providing a secure and reliable system for all	Equal variances assumed	.019	.894	.329	11	.748	.125	.380	-.710	.960
	Equal variances not assumed			.321	7.962	.756	.125	.389	-.773	1.023
how good the firm at working remotely	Equal variances assumed	.199	.664	1.488	11	.165	1.075	.723	-.516	2.666
	Equal variances not assumed			1.568	10.059	.148	1.075	.686	-.451	2.601

## Appendix 5.41 Wireless impact on e-b/c good practice in small firms

### Independent Samples Test

		Levene's Test for Equality of Variance		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
how good the firm at having a clear e-B/C goal and vision of what to do next	Equal variances assumed	5.761	.022	1.271	32	.213	.530	.417	-.320	1.380
	Equal variances not assumed			1.472	31.707					
how good the firm at having e-B/C priority based on business needs	Equal variances assumed	7.084	.012	2.318	33	.027	.870	.375	.106	1.633
	Equal variances not assumed			2.672	31.694					
how good the firm at having e-B/C benefits awareness	Equal variances assumed	.971	.332	2.002	32	.054	.791	.395	-.014	1.595
	Equal variances not assumed			2.098	22.339					
how good the firm at having awareness of e-B/C regulations and laws	Equal variances assumed	.213	.647	1.220	33	.231	.467	.383	-.312	1.247
	Equal variances not assumed			1.282	25.696					
how good the firm at responding customer needs quickly through e-B/C systems	Equal variances assumed	4.703	.038	3.117	31	.004	1.262	.405	.436	2.088
	Equal variances not assumed			3.668	30.836					
how good the firm at collaborating by sharing business activities online with trading partners	Equal variances assumed	.171	.682	1.749	33	.090	.685	.392	-.112	1.481
	Equal variances not assumed			1.783	23.666					
how good the firm at surveying employees and trading partners to evaluate e-B/C impact on	Equal variances assumed	2.855	.101	.974	33	.337	.420	.432	-.458	1.299
	Equal variances not assumed			1.106	30.945					
how good the firm at budgeting on every e-B/C project	Equal variances assumed	10.475	.003	1.979	33	.056	1.040	.526	-.029	2.109
	Equal variances not assumed			2.246	30.892					
how good the firm at reviewing information technology strategy	Equal variances assumed	3.546	.069	3.649	33	.001	1.725	.473	.763	2.686
	Equal variances not assumed			4.127	30.688					
how good the firm at empowering people through information sharing electronically	Equal variances assumed	.337	.566	2.094	32	.044	.977	.467	.027	1.928
	Equal variances not assumed			2.158	24.771					
how good the firm at training online for staff development	Equal variances assumed	6.557	.015	2.311	33	.027	1.170	.506	.140	2.201
	Equal variances not assumed			2.045	16.390					
how good the firm at delivering security/privacy policies to all parties involved	Equal variances assumed	5.135	.030	2.987	32	.005	1.424	.477	.453	2.395
	Equal variances not assumed			3.357	30.503					
how good the firm at controlling data access	Equal variances assumed	5.346	.027	2.845	33	.008	1.112	.391	.317	1.908
	Equal variances not assumed			3.414	32.954					
how good the firm at providing a secure, private and reliable system for their business and all	Equal variances assumed	7.866	.008	2.807	32	.008	.977	.348	.268	1.686
	Equal variances not assumed			3.514	29.977					
how good the firm at working remotely	Equal variances assumed	.533	.471	2.933	33	.006	1.337	.456	.410	2.264
	Equal variances not assumed			3.006	23.992					

**Appendix 5.42: Independent-sample t-test: summarised results (part 4: medium vs. small firms in mean difference of e-b/c awareness)**

<b>Subject:</b>	<u>Website</u>		<u>Ad-hoc</u>		<u>Wireless</u>	
	<b>Large</b>	<b>Small</b>	<b>Large</b>	<b>Small</b>	<b>Large</b>	<b>Small</b>
<b>Outputs:</b>						
<b>Appendix:</b>	5.43	5.46	5.44	5.47	5.45	5.48
Q16:have a clear e-b/c goal and vision	No	Yes*(p=0.000)	No	Yes*(p=0.012)	No	Yes*(p=0.001)
Q17:have e-b/c priorities based on needs	No	Yes*(p=0.002)	No	Yes*(p=0.013)	No	Yes*(p=0.001)
Q18:have full awareness of e-b/c benefits	No	Yes*(p=0.002)	No	Yes*(p=0.009)	No	Yes*(p=0.001)
Q19:have full awareness of e-b/c regulations & laws	No	Yes*(p=0.036)	No	No	No	No
Q20:quick response to customers' needs via e-b/c	No	Yes*(p=0.021)	No	Yes*(p=0.037)	No	Yes*(p=0.005)
Q21:collaboratively sharing business activities online	No	Yes*(p=0.005)	No	Yes*(p=0.010)	No	Yes*(p=0.019)
Q22:survey employee & evaluate e-b/c impact online	No	Yes*(p=0.010)	No	Yes*(p=0.038)	No	Yes*(p=0.003)
Q23:budget on every e-b/c project	No	Yes*(p=0.000)	No	Yes*(p=0.007)	No	Yes*(p=0.048)
Q24:constantly review ICT strategy	No	Yes*(p=0.009)	No	Yes*(p=0.001)	No	Yes*(p=0.000)
Q25:sharing information electronically	No	Yes*(p=0.002)	No	Yes*(p=0.001)	No	Yes*(p=0.006)
Q26:use online training for staff development	No	No	No	Yes*(p=0.000)	No	No
Q27:define & deliver security/privacy policies to all	No	Yes*(p=0.001)	No	Yes*(p=0.000)	No	Yes*(p=0.000)
Q28:control different levels of access authority	No	No	No	Yes*(p=0.003)	No	Yes*(p=0.002)
Q29:provide a secure & reliable system for all users	No	Yes*(p=0.003)	No	Yes*(p=0.000)	No	Yes*(p=0.002)
Q30:can work remotely	No	Yes*(p=0.008)	No	Yes*(p=0.000)	No	Yes*(p=0.009)



## Appendix 5.43 Website impact on e-b/c awareness in medium firms

### Independent Samples Test

		Levene's Test for Equality of Variance		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
how important for a Firm to have a clear e-b/c goal and vision of what to do next	Equal variances assumed	.072	.793	-.678	12	.511	-.455	.671	-1.916	1.007
	Equal variances not assumed			-.692	3.285	.534	-.455	.656	-2.445	1.535
how important for a firm to have e-b/c priority based on business needs	Equal variances assumed	.384	.548	-.872	11	.402	-.833	.955	-2.936	1.269
	Equal variances not assumed			-1.016	4.323	.363	-.833	.820	-3.044	1.378
how important for a firm to be aware of e-b/c benefits that bring to a business	Equal variances assumed	.260	.619	-.507	12	.621	-.364	.717	-1.926	1.199
	Equal variances not assumed			-.544	3.520	.619	-.364	.669	-2.325	1.598
how important for a firm to be aware of e-b/c relevant regulation and laws	Equal variances assumed	1.118	.313	-.656	11	.526	-.682	1.040	-2.971	1.607
	Equal variances not assumed			-1.042	2.795	.379	-.682	.655	-2.854	1.490
how important for a firm to respond customers' needs via e-b/c systems	Equal variances assumed	8.250	.015	.750	11	.469	.700	.933	-1.354	2.754
	Equal variances not assumed			1.413	9.000	.191	.700	.496	-.421	1.821
how important for to share business activities online with trading partners	Equal variances assumed	1.152	.306	.000	11	1.000	.000	.931	-2.049	2.049
	Equal variances not assumed			.000	5.056	1.000	.000	.745	-1.910	1.910
how important to evaluate e-b/c impact with employees and trading partners	Equal variances assumed	1.442	.255	-.979	11	.349	-.933	.953	-3.031	1.165
	Equal variances not assumed			-1.139	4.311	.314	-.933	.819	-3.145	1.278
how important to budget on every e-b/c project	Equal variances assumed	1.152	.306	.000	11	1.000	.000	.842	-1.853	1.853
	Equal variances not assumed			.000	2.559	1.000	.000	1.065	-3.744	3.744
how important to constantly review information technology strategy	Equal variances assumed	.027	.871	.167	11	.871	.133	.801	-1.629	1.895
	Equal variances not assumed			.173	3.501	.872	.133	.772	-2.135	2.402
how important to empower people through information sharing electronically	Equal variances assumed	.661	.433	-.228	11	.824	-.200	.879	-2.134	1.734
	Equal variances not assumed			-.186	2.637	.866	-.200	1.073	-3.897	3.497
how important to use online training for staff development	Equal variances assumed	.163	.694	-.531	11	.606	-.500	.941	-2.572	1.572
	Equal variances not assumed			-.460	2.780	.679	-.500	1.088	-4.122	3.122
how important to deliver security policies to all parties involved	Equal variances assumed	2.615	.134	.280	11	.784	.233	.832	-1.598	2.064
	Equal variances not assumed			.427	8.853	.680	.233	.547	-1.007	1.473
how important to control different levels to access the firm's data systems	Equal variances assumed	7.309	.021	-1.156	11	.272	-.867	.750	-2.517	.783
	Equal variances not assumed			-.706	2.175	.548	-.867	1.227	-5.761	4.027
how important to provide a secure, private and reliable system for all	Equal variances assumed	8.258	.015	-.746	11	.471	-.300	.402	-1.185	.585
	Equal variances not assumed			-1.406	9.000	.193	-.300	.213	-.783	.183
how important to work remotely	Equal variances assumed	.113	.743	1.210	11	.252	1.133	.937	-.928	3.195
	Equal variances not assumed			1.393	4.215	.233	1.133	.814	-1.081	3.348

## Appendix 5.44 Ad-hoc impact on e-b/c awareness in medium firms

		Independent Samples Test								
		Levene's Test for Equality of Variance		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
how important to have a clear e-B/C goal and vision of what to do next	Equal variances assumed			-1.456	12	.171	-1.462	1.004	-3.649	.726
	Equal variances not assumed						-1.462			
how important to have e-b/c priority based on business needs	Equal variances assumed			-.943	11	.366	-1.417	1.502	-4.723	1.890
	Equal variances not assumed						-1.417			
how important to be aware of e-B/C benefits that bring to business	Equal variances assumed			-.267	12	.794	-.308	1.151	-2.816	2.201
	Equal variances not assumed						-.308			
how important to respond customers' needs quickly through e-b/c systems	Equal variances assumed			.388	11	.705	.583	1.502	-2.723	3.890
	Equal variances not assumed						.583			
how important to share business activities online with trading partners	Equal variances assumed			-.755	11	.466	-1.083	1.435	-4.242	2.076
	Equal variances not assumed						-1.083			
how important to evaluate e-b/c impact on employees and trading partners	Equal variances assumed			-.997	11	.340	-1.500	1.505	-4.813	1.813
	Equal variances not assumed						-1.500			
how important to budget on every e-b/c project	Equal variances assumed			.839	11	.419	1.083	1.291	-1.758	3.924
	Equal variances not assumed						1.083			
how important to constantly review information technology strategy	Equal variances assumed			-1.109	11	.291	-1.333	1.202	-3.979	1.312
	Equal variances not assumed						-1.333			
how important to empower people through information sharing electronically	Equal variances assumed			-1.941	11	.078	-2.333	1.202	-4.979	.312
	Equal variances not assumed						-2.333			
how important to use online training for staff development	Equal variances assumed			-1.043	11	.319	-1.500	1.438	-4.665	1.665
	Equal variances not assumed						-1.500			
how important to deliver security policies to all parties involved	Equal variances assumed			-.126	11	.902	-.167	1.319	-3.070	2.737
	Equal variances not assumed						-.167			
how important to control different levels to access the company's data systems	Equal variances assumed			.000	11	1.000	.000	1.255	-2.763	2.763
	Equal variances not assumed						.000			
how important to provide a secure, private and reliable system for all	Equal variances assumed			-.386	11	.707	-.250	.647	-1.674	1.174
	Equal variances not assumed						-.250			
how important to work remotely	Equal variances assumed			-.319	11	.756	-.500	1.569	-3.954	2.954
	Equal variances not assumed						-.500			

## Appendix 5.45 Wireless impact on e-b/c awareness in medium firms

### Independent Samples Test

		Levene's Test for Equality of Variance		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
how important to have a clear e-B/C goal and vision of what to do next	Equal variances assumed	6.857	.022	.597	12	.562	.333	.558	-.884	1.550
	Equal variances not assumed			.529	5.996					
how important to have e-b/c priority based on business needs	Equal variances assumed	1.947	.190	2.018	11	.069	1.475	.731	-.133	3.083
	Equal variances not assumed			1.785	5.787					
how important to be aware of e-B/C benefits that bring to business	Equal variances assumed	2.141	.169	.348	12	.734	.208	.598	-1.094	1.511
	Equal variances not assumed			.376	11.445					
how important to be aware of e-B/C relevant regulations and laws	Equal variances assumed	2.716	.128	-2.255	11	.803	-.200	.784	-1.925	1.525
	Equal variances not assumed			-2.226	5.819					
how important to respond customer s' needs quickly through e-b/c systems	Equal variances assumed	.437	.522	.941	11	.367	.750	.797	-1.004	2.504
	Equal variances not assumed			.893	7.261					
how important to share business activities online with trading partners	Equal variances assumed	.769	.399	1.845	11	.092	1.300	.705	-.251	2.851
	Equal variances not assumed			1.616	5.618					
how important to evaluate e-b/c impact on employees and trading partners	Equal variances assumed	.548	.475	1.170	11	.267	.950	.812	-.837	2.737
	Equal variances not assumed			1.210	9.548					
how important to budget on every e-b/c project	Equal variances assumed	.003	.958	-4.450	11	.662	-.325	.723	-1.916	1.266
	Equal variances not assumed			-4.445	8.323					
how important to constantly review information technology strategy	Equal variances assumed	12.115	.005	3.517	11	.005	1.675	.476	.627	2.723
	Equal variances not assumed			2.809	4.371					
how important to empower people through information sharing electronically	Equal variances assumed	1.926	.193	1.263	11	.233	.900	.713	-.669	2.469
	Equal variances not assumed			1.159	6.511					
how important to use online training for staff development	Equal variances assumed	2.201	.166	1.227	11	.246	.950	.774	-.755	2.655
	Equal variances not assumed			1.322	10.538					
how important to deliver security policies to all parties involved	Equal variances assumed	.000	.987	1.971	11	.074	1.225	.622	-.143	2.593
	Equal variances not assumed			1.93	8.137					
how important to control different levels to access the firm's data systems	Equal variances assumed	1.692	.220	.000	11	1.000	.000	.688	-1.513	1.513
	Equal variances not assumed			.000	10.719					
how important to provide a secure, private and reliable system for all	Equal variances assumed	.121	.734	1.108	11	.291	.375	.338	-.370	1.120
	Equal variances not assumed			1.026	6.698					
how important to work remotely	Equal variances assumed	.879	.369	.900	11	.387	.750	.833	-1.084	2.584
	Equal variances not assumed			.912	8.991					

## Appendix 5.46 Website impact on e-b/c awareness in small firms

### Independent Samples Test

		Levene's Test for Equality of Variance		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
how important to have a clear e-B/C goal and vision of what to do next	Equal variances assumed	11.383	.002	4.113	35	.000	1.333	.324	.675	1.991
	Equal variances not assumed			4.186	26.071					
how important to have e-b/c priority based on business needs	Equal variances assumed	12.232	.001	3.301	35	.002	1.330	.403	.512	2.149
	Equal variances not assumed			3.358	26.383					
how important to be aware of e-B/C benefits that bring to business	Equal variances assumed	6.910	.013	3.274	35	.002	1.079	.330	.410	1.748
	Equal variances not assumed			3.319	29.198					
how important to be aware of e-B/C relevant regulations and laws	Equal variances assumed	.500	.484	2.186	35	.036	.784	.358	.056	1.511
	Equal variances not assumed			2.199	34.134					
how important to respond customer needs quickly through e-b/c svstems	Equal variances assumed	4.662	.038	2.411	34	.021	.944	.392	.148	1.740
	Equal variances not assumed			2.411	27.903					
how important to to share business activities online with trading partners	Equal variances assumed	.307	.583	3.040	34	.005	1.278	.420	.424	2.132
	Equal variances not assumed			3.040	33.465					
how important to evaluate e-b/c impact on employees and trading partners	Equal variances assumed	1.929	.174	2.744	35	.010	1.167	.425	.303	2.030
	Equal variances not assumed			2.728	32.761					
how important to budget on every e-b/c project	Equal variances assumed	4.479	.041	4.339	35	.000	1.766	.407	.940	2.592
	Equal variances not assumed			4.373	33.208					
how important to constantly review information technology strategy	Equal variances assumed	3.513	.069	2.783	35	.009	1.319	.474	.357	2.281
	Equal variances not assumed			2.805	33.189					
how important to empower people through information sharing electronically	Equal variances assumed	.637	.430	3.419	34	.002	1.222	.358	.496	1.949
	Equal variances not assumed			3.419	32.912					
how important to to use online training for staff development	Equal variances assumed	.464	.500	1.587	35	.121	.792	.499	-.221	1.806
	Equal variances not assumed			1.581	33.680					
how important to deliver security policies to all parties involved	Equal variances assumed	10.227	.003	3.586	34	.001	1.387	.387	.601	2.173
	Equal variances not assumed			3.710	27.276					
how important to control different levels to access the firm's data systems	Equal variances assumed	.565	.457	1.008	35	.320	.418	.415	-.424	1.260
	Equal variances not assumed			1.012	34.700					
how important to provide a secure, private and reliable system for all	Equal variances assumed	11.360	.002	3.217	34	.003	1.056	.328	.389	1.722
	Equal variances not assumed			3.217	22.176					
how important to work remotely	Equal variances assumed	2.293	.139	2.822	35	.008	1.161	.411	.326	1.996
	Equal variances not assumed			2.844	33.269					

## Appendix 5.47 Ad-hoc impact on e-b/c awareness in small firms

### Independent Samples Test

		Levene's Test for Equality of Variance		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
how important to have a clear e-B/C goal and vision of what to do next	Equal variances assumed	9.665	.004	-2.651	35	.012	-1.000	.377	-1.766	-.234
	Equal variances not assumed			-2.261	16.280	.038	-1.000	.442	-1.936	-.064
how important to have e-b/c priority based on business needs	Equal variances assumed	5.971	.020	-2.610	35	.013	-1.154	.442	-2.051	-.256
	Equal variances not assumed			-2.307	17.713	.033	-1.154	.500	-2.206	-.102
how important to be aware of e-B/C benefits that bring to business	Equal variances assumed	.795	.379	-2.752	35	.009	-.984	.358	-1.710	-.258
	Equal variances not assumed			-2.580	20.631	.018	-.984	.381	-1.778	-.190
how important to be aware of e-B/C relevant regulations and laws	Equal variances assumed	5.729	.022	-.694	35	.492	-.276	.397	-1.082	.531
	Equal variances not assumed			-.605	17.159	.553	-.276	.456	-1.236	.685
how important to respond customer Needs quickly through e-b/c systems	Equal variances assumed	19.367	.000	-2.176	34	.037	-.917	.421	-1.773	-.061
	Equal variances not assumed			-1.741	13.507	.104	-.917	.526	-2.050	.216
how important to share business activities online with trading partners	Equal variances assumed	.509	.481	-2.749	34	.010	-1.250	.455	-2.174	-.326
	Equal variances not assumed			-2.827	23.815	.009	-1.250	.442	-2.163	-.337
how important to evaluate e-b/c impact on employees and trading partners	Equal variances assumed	.036	.852	-2.155	35	.038	-.994	.461	-1.930	-.057
	Equal variances not assumed			-2.079	22.358	.049	-.994	.478	-1.984	-.004
how important to budget on every e-b/c project	Equal variances assumed	1.867	.181	-2.847	35	.007	-1.356	.476	-2.323	-.389
	Equal variances not assumed			-2.656	20.357	.015	-1.356	.511	-2.419	-.292
how important to constantly review information technology strategy	Equal variances assumed	.282	.599	-3.498	35	.001	-1.651	.472	-2.609	-.693
	Equal variances not assumed			-3.354	21.963	.003	-1.651	.492	-2.671	-.630
how important to empower people through information sharing electronically	Equal variances assumed	1.046	.314	-3.552	34	.001	-1.333	.375	-2.096	-.570
	Equal variances not assumed			-3.258	17.825	.004	-1.333	.409	-2.194	-.473
how important to use online training staff development	Equal variances assumed	5.313	.027	-4.122	35	.000	-1.830	.444	-2.732	-.929
	Equal variances not assumed			-4.618	33.043	.000	-1.830	.396	-2.636	-1.024
how important to deliver security policies to all parties involved	Equal variances assumed	5.725	.022	-4.310	34	.000	-1.667	.387	-2.452	-.881
	Equal variances not assumed			-3.791	16.264	.002	-1.667	.439	-2.596	-.737
how important to control different levels of authority to access firm's data systems	Equal variances assumed	1.133	.294	-3.211	35	.003	-1.244	.387	-2.030	-.457
	Equal variances not assumed			-2.961	19.733	.008	-1.244	.420	-2.120	-.367
how important to provide a secure, private and reliable system for all	Equal variances assumed	20.111	.000	-3.914	34	.000	-1.292	.330	-1.962	-.621
	Equal variances not assumed			-2.963	12.343	.012	-1.292	.436	-2.239	-.345
how important to work remotely	Equal variances assumed	.000	.991	-4.290	35	.000	-1.657	.386	-2.441	-.873
	Equal variances not assumed			-4.430	27.100	.000	-1.657	.374	-2.424	-.890

## Appendix 5.48 Wireless impact on e-b/c awareness in small firms

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
how important for a SME to have a clear e-B/C goal and vision of what to do next	Equal variances assumed	10.006	.003	3.550	33	.001	1.326	.374	.566	2.086
	Equal variances not assumed			4.456	32.150	.000	1.326	.298	.720	1.932
how important for a SME to be always prioritize e-B/C activities based on business needs	Equal variances assumed	12.334	.001	4.041	33	.000	1.663	.412	.826	2.500
	Equal variances not assumed			5.267	29.500	.000	1.663	.316	1.018	2.308
how important for a SME to be aware of e-B/C benefits that bring to business	Equal variances assumed	15.194	.000	3.901	33	.000	1.355	.347	.648	2.062
	Equal variances not assumed			5.071	29.724	.000	1.355	.267	.809	1.901
how important for a SME to be aware of e-B/C relevant regulations and laws	Equal variances assumed	.624	.435	1.169	33	.251	.486	.415	-.359	1.330
	Equal variances not assumed			1.237	26.186	.227	.486	.392	-.321	1.292
how important for a SME to respond customer needs quickly through e-B/C systems	Equal variances assumed	15.236	.000	2.987	32	.005	1.242	.416	.395	2.090
	Equal variances not assumed			3.889	26.346	.001	1.242	.319	.586	1.899
how important for a SME to collaborate by sharing business activities online with trading partners	Equal variances assumed	.215	.646	2.482	32	.019	1.144	.461	.205	2.083
	Equal variances not assumed			2.522	23.790	.019	1.144	.454	.207	2.081
how important for a SME to be survey employees and trading partners to evaluate e-B/C impact on	Equal variances assumed	.437	.513	3.197	33	.003	1.413	.442	.514	2.312
	Equal variances not assumed			3.107	20.734	.005	1.413	.455	.467	2.360
how important for a SME to budget on every e-B/C project	Equal variances assumed	14.894	.001	2.052	33	.048	1.072	.523	.009	2.136
	Equal variances not assumed			2.467	32.971	.019	1.072	.435	.188	1.957
how important for a SME to constantly review information technology strategy	Equal variances assumed	17.435	.000	5.032	33	.000	2.181	.433	1.299	3.063
	Equal variances not assumed			6.373	31.681	.000	2.181	.342	1.484	2.879
how important for a SME to empower people through information sharing electronically	Equal variances assumed	.729	.399	2.920	32	.006	1.167	.400	.353	1.981
	Equal variances not assumed			3.269	30.305	.003	1.167	.357	.438	1.895
how important for a SME to use online training for staff development	Equal variances assumed	4.269	.047	.943	33	.353	.522	.554	-.604	1.648
	Equal variances not assumed			.857	17.489	.403	.522	.609	-.760	1.803
how important for a SME to deliver security/privacy policies to all parties involved	Equal variances assumed	4.047	.053	3.925	32	.000	1.591	.405	.765	2.417
	Equal variances not assumed			4.683	31.966	.000	1.591	.340	.899	2.283
how important for a SME to control different levels of authority to access the company's data systems	Equal variances assumed	9.085	.005	3.369	33	.002	1.319	.391	.522	2.115
	Equal variances not assumed			4.071	32.998	.000	1.319	.324	.660	1.978
how important for a SME to provide a secure, private and reliable system for their business	Equal variances assumed	5.990	.020	3.404	32	.002	1.152	.338	.462	1.841
	Equal variances not assumed			4.335	28.560	.000	1.152	.266	.608	1.695
how important for a SME to work remotely	Equal variances assumed	.411	.526	2.775	33	.009	1.246	.449	.333	2.160
	Equal variances not assumed			2.808	23.155	.010	1.246	.444	.328	2.164

**Appendix 5.49: One-way ANOVA tests: (summarised results)**

<b>Hypotheses for One-way ANOVA test:</b>					
<b>Yes*</b> At least one specific level of e-b/c activities in mean scores of e-b/c good practice is significant different than in each listed business area (presented in Sig. (p) value $\leq 0.05$ with 95% confidence)					
<b>Business Areas</b>	<b>Marketing</b>	<b>Purchasing</b>	<b>Sales</b>	<b>Resource Mgt.</b>	<b>Customer service</b>
<b>Appendix</b>	5.50	5.52	5.54	5.56	5.58
<b>Outputs</b>	Sig.(p) value	Sig.(p) value	Sig.(p) value	Sig.(p) value	Sig.(p) value
Q16:have a clear e-b/c goal and vision	p=0.030 <b>Yes*</b>	p=0.438	p=0.054	p=0.653	p=0.311
Q17:have e-b/c priorities based on needs	P=0.103	p=0.163	p=0.343	p=0.451	p=0.117
Q18:have full awareness of e-b/c benefits	p=0.018 <b>Yes*</b>	p=0.253	p=0.031 <b>Yes*</b>	p=0.370	p=0.387
Q19:have full awareness of e-b/c regulations & laws	p=0.716	p=0.101	p=0.788	p=0.895	p=0.456
Q20:quick response to customers' needs via e-b/c	P=0.392	p=0.057	p=0.423	p=0.451	p=0.073
Q21:collaboratively sharing business activities online	p=0.006 <b>Yes*</b>	p=0.121	p=0.438	p=0.103	p=0.460
Q22:survey employee & evaluate e-b/c impact online	p=0.039 <b>Yes*</b>	p=0.014 <b>Yes*</b>	p=0.187	p=0.135	p=0.512
Q23:budget on every e-b/c project	p=0.404	P=0.487	p=0.014 <b>Yes*</b>	p=0.032 <b>Yes*</b>	p=0.023 <b>Yes*</b>
Q24:constantly review ICT strategy	p=0.066	p=0.038 <b>Yes*</b>	p=0.444	p=0.558	p=0.828
Q25:sharing information electronically	p=0.058	p=0.005 <b>Yes*</b>	p=0.197	p=0.141	p=0.414
Q26:use online training for staff development	p=0.042 <b>Yes*</b>	p=0.032 <b>Yes*</b>	p=0.140	p=0.387	p=0.301
Q27:define & deliver security/privacy policies to all	p=0.006 <b>Yes*</b>	p=0.072	p=0.028 <b>Yes*</b>	p=0.332	p=0.281
Q28:control different levels of access authority	P=0.359	p=0.379	p=0.973	p=0.244	p=0.672
Q29:provide a secure & reliable system for all users	p=0.020 <b>Yes*</b>	p=0.006 <b>Yes*</b>	p=0.143	p=0.027 <b>Yes*</b>	p=0.405
Q30:can work remotely	P=0.234	p=0.022 <b>Yes*</b>	p=0.074	p=0.299	p=0.371

H1 At least one specific level of e-b/c activities in mean scores of e-b/c good practice is significant different than other levels (significance value  $p \leq 0.05$ )

**Appendix 5.50**

**One-way ANOVA test: marketing activities**

**ANOVA**

		Sum of Squares	df	Mean Square	F	Sig.
how good the company at having a clear e-B/C goal and vision of what to do next	Between Groups	12.304	3	4.101	3.269	.030
	Within Groups	57.716	46	1.255		
	Total	70.020	49			
how good the company at proritizing e-B/C activities based on business needs	Between Groups	8.423	3	2.808	2.182	.103
	Within Groups	59.197	46	1.287		
	Total	67.620	49			
how good the company at having e-B/C benefits awareness	Between Groups	11.396	3	3.799	3.716	.018
	Within Groups	47.024	46	1.022		
	Total	58.420	49			
how good the company at having awareness of e-B/C regulations and laws	Between Groups	1.810	3	.603	.454	.716
	Within Groups	59.863	45	1.330		
	Total	61.673	48			
how good the company at responding customer needs quickly through e-B/C systems	Between Groups	5.723	3	1.908	1.022	.392
	Within Groups	82.090	44	1.866		
	Total	87.813	47			
how good the company at collaborating by sharing business activities online with trading partners	Between Groups	16.159	3	5.386	4.734	.006
	Within Groups	52.341	46	1.138		
	Total	68.500	49			
how good the company at surveying employees and trading partners to evaluate e-B/C impact on	Between Groups	12.750	3	4.250	3.030	.039
	Within Groups	64.530	46	1.403		
	Total	77.280	49			
how good the company at budgeting on every e-B/C project	Between Groups	6.241	3	2.080	.994	.404
	Within Groups	96.259	46	2.093		
	Total	102.500	49			
how good the company at reviewing information technology strategy	Between Groups	13.490	3	4.497	2.569	.066
	Within Groups	80.530	46	1.751		
	Total	94.020	49			
how good the company at empowering people through information sharing electronically	Between Groups	12.083	3	4.028	2.681	.058
	Within Groups	67.591	45	1.502		
	Total	79.673	48			
how good the company at training online for staff development	Between Groups	15.957	3	5.319	2.951	.042
	Within Groups	82.923	46	1.803		
	Total	98.880	49			
how good the company at delivering security/privacy policies to all parties involved	Between Groups	20.786	3	6.929	4.742	.006
	Within Groups	65.745	45	1.461		
	Total	86.531	48			
how good the company at controlling data access	Between Groups	4.448	3	1.483	1.099	.359
	Within Groups	62.052	46	1.349		
	Total	66.500	49			
how good the company at providing a secure, private and reliable system for their business and all	Between Groups	9.072	3	3.024	3.605	.020
	Within Groups	37.745	45	.839		
	Total	46.816	48			
how good the company at working remotely	Between Groups	8.030	3	2.677	1.475	.234
	Within Groups	83.490	46	1.815		
	Total	91.520	49			



## Appendix 5.51 Post hoc tests: levels of marketing activities

Duncan <sup>a,b</sup>

the business activities in marketing that implies the level of e-activities in the business process	N	Subset for alpha = .05	
		1	2
no marketing activities, level 1	3	2.33	
some traditional marketing activities, level 2	25	3.20	3.20
online marketing activities, level 3	14		3.71
Both online and offline marketing activities, level 4	8		4.25
Sig.		.115	.071

Means for groups in homogeneous subsets are displayed.

- Uses Harmonic Mean Sample Size = 7.020.
- The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

**Table 5.51.1 how good the company at having e-B/C benefits awareness**

Duncan <sup>a,b</sup>

the business activities in marketing that implies the level of e-activities in the business process	N	Subset for alpha = .05	
		1	2
no marketing activities, level 1	3	1.33	
some traditional marketing activities, level 2	25	2.36	2.36
online marketing activities, level 3	13		3.15
Both online and offline marketing activities, level 4	9		3.44
Sig.		.076	.075

Means for groups in homogeneous subsets are displayed.

- Uses Harmonic Mean Sample Size = 7.020.
- The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

**Table 5.51.2 how good the company at collaborating by sharing business activities online with trading partners**

Duncan <sup>a,b</sup>

the business activities in marketing that implies the level of e-activities in the business process	N	Subset for alpha = .05	
		1	2
no marketing activities, level 1	3	1.00	
some traditional marketing activities, level 2	25	1.80	1.80
online marketing activities, level 3	9		2.44
Both online and offline marketing activities, level 4	13		2.77
Sig.		.209	.151

Means for groups in homogeneous subsets are displayed.

- a. Uses Harmonic Mean Sample Size = 7.020.
- b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

**Table 5.51.3 how good the company at surveying employees and trading partners to evaluate e-B/C impact on them**

Duncan <sup>a,b</sup>

the business activities in marketing that implies the level of e-activities in the business process	N	Subset for alpha = .05
		1
no marketing activities, level 1	25	1.80
some traditional marketing activities, level 2	3	2.00
online marketing activities, level 3	13	2.92
Both online and offline marketing activities, level 4	19	3.00
Sig.		.130

Means for groups in homogeneous subsets are displayed.

- a. Uses Harmonic Mean Sample Size = 7.020.
- b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

**Table 5.51.4 how good the company at training online for staff**

Duncan <sup>a,b</sup>

the business activities in marketing that implies the level of e-activities in the business process	N	Subset for alpha = .05	
		1	2
no marketing activities, level 1	3	1.33	
some traditional marketing activities, level 2	24		2.96
online marketing activities, level 3	13		3.54
Both online and offline marketing activities, level 4	9		4.11
Sig.		1.000	.096

Means for groups in homogeneous subsets are displayed.

- a. Uses Harmonic Mean Sample Size = 7.020.
- b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

**Table 5.51.5 how good the company at delivering security/privacy policies to all parties involved**

Duncan <sup>a,b</sup>

the business activities in marketing that implies the level of e-activities in the business process	N	Subset for alpha = .05
		1
no marketing activities, level 1	24	3.63
some traditional marketing activities, level 2	3	4.33
online marketing activities, level 3	13	4.46
Both online and offline marketing activities, level 4	19	4.56
Sig.		.086

Means for groups in homogeneous subsets are displayed.

- a. Uses Harmonic Mean Sample Size = 7.020.
- b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

**Table 5.51.6 how good the company at providing a secure, private and reliable system for their business and all users**

## Appendix 5.52 One-way ANOVA tests: purchasing activities

### ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
how good the company at having a clear e-B/C goal and vision of what to do next	Between Groups	2.442	2	1.221	.840	.438
	Within Groups	66.823	46	1.453		
	Total	69.265	48			
how good the company at prioritizing e-B/C activities based on business needs	Between Groups	5.128	2	2.564	1.889	.163
	Within Groups	62.423	46	1.357		
	Total	67.551	48			
how good the company at having e-B/C benefits awareness	Between Groups	3.377	2	1.688	1.416	.253
	Within Groups	54.828	46	1.192		
	Total	58.204	48			
how good the company at having awareness of e-B/C regulations and laws	Between Groups	5.857	2	2.929	2.413	.101
	Within Groups	54.622	45	1.214		
	Total	60.479	47			
how good the company at responding customer needs quickly through e-B/C systems	Between Groups	10.441	2	5.220	3.052	.057
	Within Groups	75.261	44	1.710		
	Total	85.702	46			
how good the company at collaborating by sharing business activities online with trading partners	Between Groups	5.859	2	2.929	2.212	.121
	Within Groups	60.917	46	1.324		
	Total	66.776	48			
how good the company at surveying employees and trading partners to evaluate e-B/C impact on	Between Groups	11.650	2	5.825	4.687	.014
	Within Groups	57.167	46	1.243		
	Total	68.816	48			
how good the company at budgeting on every e-B/C project	Between Groups	3.102	2	1.551	.730	.487
	Within Groups	97.673	46	2.123		
	Total	100.776	48			
how good the company at reviewing information technology strategy	Between Groups	12.349	2	6.174	3.510	.038
	Within Groups	80.917	46	1.759		
	Total	93.265	48			
how good the company at empowering people through information sharing electronically	Between Groups	16.729	2	8.365	6.063	.005
	Within Groups	62.083	45	1.380		
	Total	78.813	47			
how good the company at training online for staff development	Between Groups	13.769	2	6.884	3.725	.032
	Within Groups	85.007	46	1.848		
	Total	98.776	48			
how good the company at delivering security/privacy policies to all parties involved	Between Groups	9.563	2	4.781	2.797	.072
	Within Groups	76.917	45	1.709		
	Total	86.479	47			
how good the company at controlling data access	Between Groups	2.727	2	1.363	.991	.379
	Within Groups	63.273	46	1.376		
	Total	66.000	48			
how good the company at providing a secure, private and reliable system for their business and all	Between Groups	9.521	2	4.760	5.744	.006
	Within Groups	37.292	45	.829		
	Total	46.813	47			
how good the company at working remotely	Between Groups	13.609	2	6.804	4.164	.022
	Within Groups	75.167	46	1.634		
	Total	88.776	48			

## Appendix 5.53 Post hoc tests: levels of purchasing activities

Duncan a,b

the business activities in purchasing that implies different levels of e-activities in the business process	N	Subset for alpha = .05	
		1	2
traditional purchasing, level 1	12	1.75	
Online sourcing but traditional Payment, level 2	25	1.80	
Sourcing & payment online, Level 3	12		2.92
Sig.		.904	1.000

Means for groups in homogeneous subsets are displayed.

- Uses Harmonic Mean Sample Size = 14.516.
- The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

**Table 5.53.1 how good the company at surveying employees and trading partners to evaluate e-B/C impact on them**

Duncan a,b

the business activities in purchasing that implies the level of e-activities in the business process	N	Subset for alpha = .05	
		1	2
Traditional purchasing, level 1	25	2.80	
Online sourcing but traditional payment, level 2	12	2.92	
Sourcing & payment Online, level 3	12		4.00
Sig.		.814	1.000

Means for groups in homogeneous subsets are displayed.

- Uses Harmonic Mean Sample Size = 14.516.
- The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

**Table 5.53.2 how good the company at reviewing information technology strategy**

Duncan <sup>a,b</sup>

the business activities in purchasing that implies different levels of e-activities in the business process	N	Subset for alpha = .05	
		1	2
Online sourcing but Traditional payment, level 2	12	2.67	
Traditional purchasing, level 1	24	2.75	
sourcing and payment online, level 3	12		4.08
Sig.		.850	1.000

Means for groups in homogeneous subsets are displayed.

- a. Uses Harmonic Mean Sample Size = 14.400.
- b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

**Table 5.53.3 how good the company at empowering people through information sharing electronically**

Duncan <sup>a,b</sup>

the business activities in purchasing that implies different levels of e-activities in business process	N	Subset for alpha = .05	
		1	2
Traditional purchasing, Level , 1	12	1.92	
Sourcing online but traditional Payment, level, 2	25	2.08	
sourcing and payment online, level 3	12		3.25
Sig.		.748	1.000

Means for groups in homogeneous subsets are displayed.

- a. Uses Harmonic Mean Sample Size = 14.516.
- b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

**Table 5.53.4 how good the company at training online for staff development**

Duncan<sup>a,b</sup>

the business activities in purchasing that implies different levels of e-activities in business proces:	N	Subset for alpha = .05	
		1	2
traditional purchasing, level 1	24	3.79	
online sourcing but traditional payment, level 2	12	3.83	
sourcing and payment online, level 3	12		4.83
Sig.		.903	1.000

Means for groups in homogeneous subsets are displayed.

- a. Uses Harmonic Mean Sample Size = 14.400.
- b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

**Table 5.53.5 how good the company at providing a secure, private and reliable system for their business and all users**

Duncan<sup>a,b</sup>

the business activities in purchasing that implies different levels of e-activities in the business process	N	Subset for alpha = .05	
		1	2
Traditional purchasing , level 1	25	3.00	
Online sourcing but traditional payment, level 2	12	3.08	
Sourcing and payment online, level 3	12		4.25
Sig.		.861	1.000

Means for groups in homogeneous subsets are displayed.

- a. Uses Harmonic Mean Sample Size = 14.516.
- b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

**Table 5.53.6 how good the company at working remotely**

## Appendix 5.54 One-way ANOVA tests: sales activities

### ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
how good the company at having a clear e-B/C goal and vision of what to do next	Between Groups	8.206	2	4.103	3.120	.054
	Within Groups	60.488	46	1.315		
	Total	68.694	48			
how good the company at proritizing e-B/C activities based on business needs	Between Groups	3.004	2	1.502	1.097	.343
	Within Groups	62.996	46	1.369		
	Total	66.000	48			
how good the company at having e-B/C benefits awareness	Between Groups	7.900	2	3.950	3.758	.031
	Within Groups	48.345	46	1.051		
	Total	56.245	48			
how good the company at having awareness of e-B/C regulations and	Between Groups	.650	2	.325	.240	.788
	Within Groups	61.016	45	1.356		
	Total	61.667	47			
how good the company at responding customer needs quickly through e-B/C systems	Between Groups	3.294	2	1.647	.877	.423
	Within Groups	84.519	45	1.878		
	Total	87.813	47			
how good the company at collaborating by sharing business activities online with trading partners	Between Groups	2.412	2	1.206	.841	.438
	Within Groups	65.996	46	1.435		
	Total	68.408	48			
how good the company at surveying employees and trading partners to evaluate e-B/C impact on	Between Groups	5.349	2	2.675	1.741	.187
	Within Groups	70.651	46	1.536		
	Total	76.000	48			
how good the company at budgeting on every e-B/C project	Between Groups	26.852	2	13.426	8.791	.001
	Within Groups	70.250	46	1.527		
	Total	97.102	48			
how good the company at reviewing information technology strategy	Between Groups	3.097	2	1.548	.826	.444
	Within Groups	86.250	46	1.875		
	Total	89.347	48			
how good the company at empowering people through information sharing electronically	Between Groups	5.439	2	2.720	1.685	.197
	Within Groups	74.234	46	1.614		
	Total	79.673	48			
how good the company at training online for staff development	Between Groups	7.963	2	3.982	2.055	.140
	Within Groups	89.139	46	1.938		
	Total	97.102	48			
how good the company at delivering security/privacy policies to all parties involved	Between Groups	12.657	2	6.328	3.887	.028
	Within Groups	73.260	45	1.628		
	Total	85.917	47			
how good the company at controlling data access	Between Groups	.079	2	.039	.027	.973
	Within Groups	66.329	46	1.442		
	Total	66.408	48			
how good the company at providing a secure, private and reliable system for their business and all	Between Groups	3.793	2	1.896	2.027	.143
	Within Groups	43.024	46	.935		
	Total	46.816	48			
how good the company at working remotely	Between Groups	9.206	2	4.603	2.763	.074
	Within Groups	76.631	46	1.666		
	Total	85.837	48			



## Appendix 5.55 Post-hoc test: levels of sales activities

Duncan <sup>a,b</sup>

the business activities in sales implies different levels of e-activities in the business process	N	Subset for alpha = .05	
		1	2
traditional approach to customer, level 1	28	3.14	
online catalogue, traditional ways to take orders, level 2	12	3.92	3.92
order/modify orders and pay online, level 3	9		4.00
Sig.		.060	.837

Means for groups in homogeneous subsets are displayed.

- Uses Harmonic Mean Sample Size = 13.034.
- The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

**Table 5.55.1 how good the company at having e-B/C benefits awareness**

Duncan <sup>a,b</sup>

the business activities in sales implies different levels of e-activities in the business process	N	Subset for alpha = .05	
		1	2
traditional approach to customer, level 1	28	2.75	
online catalogue, traditional ways to take orders, level 2	9	3.67	3.67
order/modify orders and pay online, level 3	12		4.50
Sig.		.065	.92

Means for groups in homogeneous subsets are displayed.

- Uses Harmonic Mean Sample Size = 13.034.
- The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

**Table 5.55.2 how good the company at budgeting on every e-B/C project**

## Appendix 5.56 One-way ANOVA: resource management activities

### ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
how good the company at having a clear e-B/C goal and vision of what to do next	Between Groups	2.409	3	.803	.546	.653
	Within Groups	67.611	46	1.470		
	Total	70.020	49			
how good the company at prioritizing e-B/C activities based on business needs	Between Groups	3.726	3	1.242	.894	.451
	Within Groups	63.894	46	1.389		
	Total	67.620	49			
how good the company at having e-B/C benefits awareness	Between Groups	3.818	3	1.273	1.072	.370
	Within Groups	54.602	46	1.187		
	Total	58.420	49			
how good the company at having awareness of e-B/C regulations and laws	Between Groups	.816	3	.272	.201	.895
	Within Groups	60.858	45	1.352		
	Total	61.673	48			
how good the company at responding customer needs quickly through e-B/C systems	Between Groups	5.057	3	1.686	.896	.451
	Within Groups	82.755	44	1.881		
	Total	87.813	47			
how good the company at collaborating by sharing business activities online with trading partners	Between Groups	8.541	3	2.847	2.184	.103
	Within Groups	59.959	46	1.303		
	Total	68.500	49			
how good the company at surveying employees and trading partners to evaluate e-B/C impact on	Between Groups	8.708	3	2.903	1.947	.135
	Within Groups	68.572	46	1.491		
	Total	77.280	49			
how good the company at budgeting on every e-B/C project	Between Groups	17.694	3	5.898	3.199	.032
	Within Groups	84.806	46	1.844		
	Total	102.500	49			
how good the company at reviewing information technology strategy	Between Groups	4.097	3	1.366	.699	.558
	Within Groups	89.923	46	1.955		
	Total	94.020	49			
how good the company at empowering people through information sharing electronically	Between Groups	9.013	3	3.004	1.913	.141
	Within Groups	70.660	45	1.570		
	Total	79.673	48			
how good the company at training online for staff development	Between Groups	6.238	3	2.079	1.032	.387
	Within Groups	92.642	46	2.014		
	Total	98.880	49			
how good the company at delivering security/privacy policies to all parties involved	Between Groups	6.261	3	2.087	1.170	.332
	Within Groups	80.269	45	1.784		
	Total	86.531	48			
how good the company at controlling data access	Between Groups	5.707	3	1.902	1.439	.244
	Within Groups	60.793	46	1.322		
	Total	66.500	49			
how good the company at providing a secure, private and reliable system for their business and all	Between Groups	8.537	3	2.846	3.345	.027
	Within Groups	38.279	45	.851		
	Total	46.816	48			
how good the company at working remotely	Between Groups	6.948	3	2.316	1.260	.299
	Within Groups	84.572	46	1.839		
	Total	91.520	49			

**Appendix 5.57 Post-hoc test: levels of resource management activities**

Duncan <sup>a,b</sup>

the business activities in resource mgt. that implies different levels of e-activities in the business process	N	Subset for alpha = .05	
		1	2
no resource management activities, level 1	17	2.59	
some resource management activities, level 2	13	3.38	3.38
regular resource management activities, level 3	18	3.72	3.72
electronic resource management system, level 4	2		5.00
Sig.		.187	.061

Means for groups in homogeneous subsets are displayed.

- a. Uses Harmonic Mean Sample Size = 5.786.
- b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

**Table 5.57.1 how good the company at budgeting on every e-B/C project**

Duncan <sup>a,b</sup>

the business activities in resource management that implies different e-activities in the business process	N	Subset for alpha = .05	
		1	2
no resource management activities, level 1	17	3.71	
some resource management activities, level 2	12	3.75	
regular resource management activities, level 3	18	4.50	4.50
electronic resource management system, level 4	2		5.00
Sig.		.176	.364

Means for groups in homogeneous subsets are displayed.

- a. Uses Harmonic Mean Sample Size = 5.733.
- b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

**Table 5.57.2 how good the company at providing a secure, private and reliable system for their business and all users**

## Appendix 5.58 One-way ANOVA test: customer service activities

### ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
how good the company at having a clear e-B/C goal and vision of what to do next	Between Groups	5.182	3	1.727	1.225	.311
	Within Groups	64.838	46	1.410		
	Total	70.020	49			
how good the company at prioritizing e-B/C activities based on business needs	Between Groups	8.054	3	2.685	2.073	.117
	Within Groups	59.566	46	1.295		
	Total	67.620	49			
how good the company at having e-B/C benefits awareness	Between Groups	3.688	3	1.229	1.033	.387
	Within Groups	54.732	46	1.190		
	Total	58.420	49			
how good the company at having awareness of e-B/C regulations and laws	Between Groups	3.435	3	1.145	.885	.456
	Within Groups	58.239	45	1.294		
	Total	61.673	48			
how good the company at responding customer needs quickly through e-B/C systems	Between Groups	12.711	3	4.237	2.482	.073
	Within Groups	75.101	44	1.707		
	Total	87.813	47			
how good the company at collaborating by sharing business activities online with trading partners	Between Groups	3.708	3	1.236	.878	.460
	Within Groups	64.792	46	1.409		
	Total	68.500	49			
how good the company at surveying employees and trading partners to evaluate e-B/C impact on	Between Groups	3.731	3	1.244	.778	.512
	Within Groups	73.549	46	1.599		
	Total	77.280	49			
how good the company at budgeting on every e-B/C project	Between Groups	19.035	3	6.345	3.497	.023
	Within Groups	83.465	46	1.814		
	Total	102.500	49			
how good the company at reviewing information technology strategy	Between Groups	1.780	3	.593	.296	.828
	Within Groups	92.240	46	2.005		
	Total	94.020	49			
how good the company at empowering people through information sharing electronically	Between Groups	4.856	3	1.619	.974	.414
	Within Groups	74.818	45	1.663		
	Total	79.673	48			
how good the company at training online for staff development	Between Groups	7.482	3	2.494	1.255	.301
	Within Groups	91.398	46	1.987		
	Total	98.880	49			
how good the company at delivering security/privacy policies to all parties involved	Between Groups	6.971	3	2.324	1.314	.281
	Within Groups	79.560	45	1.768		
	Total	86.531	48			
how good the company at controlling data access	Between Groups	2.176	3	.725	.519	.672
	Within Groups	64.324	46	1.398		
	Total	66.500	49			
how good the company at providing a secure, private and reliable system for their business and all	Between Groups	2.905	3	.968	.992	.405
	Within Groups	43.911	45	.976		
	Total	46.816	48			
how good the company at working remotely	Between Groups	5.971	3	1.990	1.070	.371
	Within Groups	85.549	46	1.860		
	Total	91.520	49			

## Appendix 6.1

### Semi-structured interview framework

#### **PART 1 BUSINESS PRIORITISES**

Requesting companies to rank the importance of six main business areas in order to identify the priority of their business.

#### **PART 2 DETAILED e-ACTIVITIES IN BUSINESS PROCESS**

- Purchasing
- Resource Management
- Marketing
- Sales
- Customer Service
- Communication & Collaboration

#### **PART 1**

**Q1** Can you please rank the following business areas that are most important to your business?

**Score 1=most important, 2=next important, etc.**

Purchasing	( )
Resource Management	( )
Marketing	( )
Sales	( )
Customer Service	( )
Communication & Collaboration	( )

## **PART 2**

### **2.1 PURCHASING**

**QT** How many regular suppliers do you have? What methods do you employ to source goods/suppliers?

**QS** Are you aware of how e-procurement can improve your purchasing efficiency?

**QE** Do you source suppliers, investigate products and compare prices to find the best deal when needed via the Internet?

**QP** Do you...

- mainly source goods/suppliers by online and share business information with your regular suppliers by using online catalogues or catalogues that are based on flexible negotiated prices?
- have frequently updated supplier evaluation reports which are available online?

**QeC** Do your suppliers offer...

- you the alternative methods to pay for the transactions from their websites?
- you the option to detailed information of your purchases and the order status?

**QeB** Do you...

- process the whole purchase electronically via a shared common database, EDI (Electronic Data Interchange) or electronic procurement system?
- allow the major suppliers secure access to your stock databases so that they can check your purchasing requirement and demand? How do you manage your suppliers?

## **2.2 RESOURCE MANAGEMENT**

- QT** Do you manage resources (stock, job schedule and etc.) and record business information manually?
- QS** Are you aware that e-technology or software can be beneficial to resource management?
- QE** Do you record customers' sales orders to a stand-alone electronic systems (spreadsheet, sage and etc.) or a manual systems (sales record book)?
- QP** Are these orders sent and recorded electronically?
- QeC** How easily can you view the resource capacity? Can your customers and suppliers view your schedules?
- QeB** Do you have a business system that links all resource information, analyses the capacity and the cost, and shares relevant information with all parties involved?

## **2.3 MARKETING**

- QT** What are your target markets and customers? What is your marketing plan?
- QS** Are you aware of
- how web-marketing can be beneficial to your whole marketing plan?
  - your competitor's activities in marketing/Internet marketing?
- QE** Do you promote your products/services information to your potential customers via emails? Can customers get in contact with you wherever they want?
- QP** Do you have a website?  
Do you promote your website?  
Do you...
- advertise your website online?
  - promote your search engine?

- advertise in print publications and in other media as well as advertising online?

**QeC** Do you use your website to approach potential customers as well as promoting your business? Do you:

- survey your customers for targeting prospects?
- provide products/service/prices information for customers to download and print off?
- create detailed customers profiles and identify new selling opportunities?
- send SMS messages to alert customers to time-specific information?

**QeB** In terms of using advanced e-marketing strategies do you...

- consolidate and broaden customer base through improved knowledge of customers? How?
- use discussion boards and newsletters to encourage repeat visits to your site and asking users suggestions to improve the site?
- create memorable, personalized marketing campaigns?
- find new markets worldwide, access research data and computer software, and search for new ideas, support or help facilities via the Internet?
- Employ any Customer Relationship Management (CRM) processes internally or through an external contractor?
- monitor web-marketing campaign and assess the results? How?

## **2.4 SALES**

**QT** What are your sales targets?

**QS** Are you aware if your products/services are suitable for online trading?

If the answer is YES, have you analysed the benefits and problems of trading online?

**QE** Would you:



- use the strategy of online selling as an extra sales channel or move to solely trade online?
- use the Internet to find new customers?

**QP** How do your customers find about your products/services? How can they contact the sales department?

**QeC** Can your customers:

- order from you whenever they want and choose an ordering method suitable for them?
- be automatically notified of their orders?
- choose to pay different currencies via your website?
- find out about purchasing policies, data protection acts and other relevant regulations from you whenever they want?

**QeB** How:

- flexible are the payment methods on offer to your customers?
- secure is your website to support electronic transactions?
- easy is it for your customers to check on the status of an order?
- efficient is your sales team at producing sales reports and existing customer profile?
- well do you use the real-time information from the Internet to match prices to demand?

## **2.5 CUSTOMER SERVICE**

**QT** How do you rate the customer service that you provide? How do you normally measure customer satisfaction?

**QS** Are you aware of how e-strategies can improve customer service?

**QE** Do you offer free information/service to your existing customers? How efficient the products information and service can be delivered to your customers?

**QP** How do your customers contact with their queries?

**QeC**

- Do you have a method to evaluate satisfaction after sales?

- How do you measure customer value, retention and potential?
- What electronic/automatic systems do you have in order to consolidate the relationship with your customers?

**QeB** Are you able to deliver a personalised customer service?

## **2.6 COMMUNICATION & COLLABORATION**

**QT** Do you communicate and work with others effectively both internally and externally?

**QS** Are you aware of how e-technologies can improve internal and external communication?

**QE** What communication methods do you employ?

Can you please rank the following communication methods/tools?

**Score 1=most primary method, 2=next primary method, etc...**

Phone( ) Fax( ) e-mail( ) Others( ) please specify.....

**QP** Internally, how well are you able to share information and computer facilities?

**QeC** How do your staff and members of your firm stay in touch with business archives outside of the office?

Can you please rank the following methods?

**Score 1=most primary method, 2=next primary method, etc...**

Electronic message board( ) Website( ) Videoconference( )

Mobile via e-message( ) Company Intranet( )

Others( ) please specify.....

**QeB** How do you share up-to-date information with supply chain partners, related businesses, trade groups etc.? What system is in place to do this?

## **Appendix 6.2**

### **Company background**

The company is based at Bromborough, it has been trading for over fifty years, offering its services to the audio visual and presentation market. It employs approximately thirty employees (6 staff in Manchester office) with a turnover of approximately two Million pounds. As well as a sales division offering an excellent range of audio visual equipment, the company has a hire division operating from locations in Merseyside and Manchester. Fisher's conference division provides services for exhibitions, road shows, corporate events, sports events etc. From simple presentations to spectacular shows, the in-house expert team can conduct the design, project management and delivery of a high profile event. Typically, at the forthcoming Open Golf tournament at Hoylake, the company will be providing AV displays for scoreboards. It does not manufacture any products. All AV equipment is externally sourced. The company aim to add value by providing a high quality service. New ideas constantly emerge all the time, such as digital signage and real-time LCD displays.

### **ICT Knowledge / Skills (level 3)**

The company is fully aware of how e-business/e-commerce could be beneficial to their business, especially in sales and marketing. Knowledge/skills are focused on the company products and services but not emphasised in ICT or e-B/C. Therefore, they lack in house ICT expertise and use external IT support when any unexpected ICT problems occur.

### **ICT Infrastructure (level 3)**

The company has a Local Area Network (LAN). The integrated system supports their key e-b/c and business activities, which is typified by CRM. The CRM system is able to capture customer order details for storage on a customer information database. The infrastructure also provides a secure platform for online purchasing.

**Web Marketing (level 4)**

The company is fully aware of the importance of web marketing and adhere to an annual marketing plan. The company has strong web marketing features. A Google pay-per-click arrangement is in place and generated up to ten percent of new business within the last year. Websites are promoted, but “with business restraint”; the company does not engage in spamming, do not chase up casual website hits, and are keen to build and maintain reputation. Some telemarketing and email promotions (the website supports a mailing list function) are conducted. Monitoring competitor websites is also common practice.

**Website (level 3)**

The company has two websites. One is for its conference service division and the other is for selling the AV equipment. The company is a fully functional website that supports online purchasing, generating five percent to ten percent of revenue for the company. However, no integration exists between their system and with their suppliers’ system.

**Resource Management (level 1)**

AV equipment is sourced from reliable suppliers who have strong trading links with the company. ‘Traditional’ purchasing methods are used. All items for resale or use in area (AV equipments) are sourced from reliable suppliers, using “traditional” purchasing methods (no e-purchasing). No electronic inventory control is in place and is conducted manually. A planning board is used to judge workload for event displays, requiring personnel. No electronic order management or order tracking system exists.

**Response to Customer (level 4)**

Customer service is identified as the most important success factors for the company. Therefore a quick response to customer enquiries is critical. A CRM (Customer Relationship Management) systems in place and is actively used. Customer order details are captured and held in a customer information database. Customers submit their enquiries via e-

mail or phone or fax. The company is able to process enquiries in an efficient manner with the aid of a CRM system holding customer profile information. The benefits of an e-b/c system are clearly demonstrated. The company does not engage in any form of cold calling. They actively encourage their customers to contact them by electronic means.

### **e-B/C Strategy (level 3)**

The company aims to grow and develop the business by providing leading edge technology for AV systems, coupled with a high quality customer service. Web marketing, online sales and real-time customer response are essential to sustain the business. In-house business control is very “traditional” in a sense, but customer interface is state of the art and highly polished. Based on their awareness of e-b/c and the priorities of the business the company continuously aims to improve and expand their e-b/c activities by adhering to their plan.

### **Internal Communication (level 2)**

It appears that internal communication is less of a priority. Apart from regular verbal communication, the use of email, phone and fax, the company actively supports mobile working. Staff are able to access the company product information remotely through wireless devices, PDA /laptops and mobile phones.

## **Appendix 6.3**

### **Company background**

The company was formed in 2003 and employs thirty seven people, with an annual sales turnover of £1.8M. Their core business operation is to purchase glass and temper it so that it becomes more durable. Two types of product are created. These are:

1. Glass cut to size and tempered
2. Glass cut to size, shaped and drilled

Cutting is performed on an automatic optimising cutting machine. Both product lines are then placed inside a furnace. On exit, air blast fans are used to cool the products.

### **ICT Knowledge/Skills (level 3)**

The company possess some e-b/c awareness but have limited ICT knowledge and skills. This prevents them from further developing e-b/c activities. External support is required when ICT problems occur.

### **ICT Infrastructure (level 2)**

A basic internal network server exists, typified by a LAN (local area network). The ICT infrastructure is supportive for a wide range of e-b/c activities, but is currently being used for file sharing only. The company website is still being developed (used mainly for publicity purposes), and has yet to be completed.

### **Web Marketing (level 0)**

Potential customers are mainly dealt with by face-to-face contact and telephone. No other traditional marketing activities or web marketing are employed. Having no presence on the internet means that customers may find it difficult to obtain information on the company's products and services.

### **Website (level 0)**

Research has shown that there is a gradual trend in the uptake of online ordering. However, the company website remains inactive and requires further construction.

### **Resource Management (level 1)**

The company manages resources manually, which includes recording stock information and job scheduling. Implementation costs and perceived necessity are two main reasons which prevent the company from adopting an electronic resource management system.

### **Response to Customer (level 1)**

The company has approximately ninety customers with ninety percent of order intake via fax. Daily communication with customers is mainly conducted via the phone and within office hours. For the Type 2 glass product, the main customers are architects. To process the order, technical drawings are required to be transferred in order for glass requirements to be determined. The methods employed by the company to undertake this, appear to be inefficient.

### **e-B/C Strategy (level 2)**

The e-b/c level is recognised as very low. The company does realise that e-b/c could bring additional benefits into their business and are willing to explore further possibilities. Sales and customer service could be the priorities in terms of improving the business. The company also intends to increase their e-b/c level by completing their website and ensuring that it will assist them to drive the business forward.

### **Internal Communication (level 1)**

Staff communication is conducted personally, by email or by 'post-it' notes. This is all within office hours. Mobile working is currently not supported, although it could be if required.

## **Appendix 6.4**

### **Company background**

The company is a specialist manufacturer of complete fabrications for float glass handling, employing fifty staff at its Merseyside premises. A smaller offshoot, produces specially engineered components for customised passenger lifts (an example can be found within the new M&S department store in Manchester). The company began trading in 1964, working for companies such as Kellogs, Shell and Pilkington. Gradually, they worked their way to become the market leader in float glass manufacturing and receive orders from glass plants licensed by Pilkington on a global scale. At present, the company has an order book that is two years long and is in a position to be selective over the work that they undertake. The company are concerned not to expand too rapidly as they recognise that the business was now at a critical size and are conscious with the issue of control.

The company recognises the need to add value to their engineered product through improved service provision, e.g. acting as co-ordinating agent for glass installation at customer site where electrics, software and components in the finished assembly all require to be completed in addition to the glass float handling hardware supplied by the company. This will conceivably require a greater degree of project management and co-ordination of different contractor activities. There is little evidence to suggest that e-b/c activities are being explored within the company.

### **ICT Knowledge / Skills (level 2)**

The company has no knowledge and awareness of e-b/c, which prevents them from adopting e-b/c solutions. The main focus of the business is on product quality. Due to a lack of knowledge/skills in ICT, a basic ICT infrastructure is in place. Support is provided on an ad-hoc basis when issues occur.



### **ICT Infrastructure (level 1)**

Basic PC connectivity allows files to be shared internally. A website is currently being developed (used for publicity purposes at present). The website is being created, hosted and maintained by an external IT company.

### **Web Marketing (level 0)**

For each enquiry, the Managing Director derives a job cost via technical knowledge and previous experience. No software costing system is in place. The main issue lies with the estimation of labour. At present, no marketing activities exist. New business is gained from 'word of mouth' advertising from its existing customer base. Although a global market, customers are not numerous, and industry members all seem to know each other and are aware of current events within the market. Web-marketing is an irrelevant concept. No CRM is in place, and huge reliance is placed on networking and having one's "ear to the ground".

### **Website (level 1)**

The company does have a website but only because "everyone else has one". The website is very basic with no online catalogue and does not have ordering capabilities.

### **Resource Management (level 1)**

The company do not regularly review demand and resource balance. Materials are ordered from a small range of suppliers using "traditional", non e-business methods. As part of the tendering process, machining time requirement is estimated. When a job is confirmed, the planning board is updated accordingly. The materials are ordered accordingly, depending on the specification of each job. Material cost versus tender is known but labour costs are only approximate. No Shop Floor Data Collection is in place. The Managing Director sees little point in an electronic and scheduling system since it would be costly to buy, train for and maintain. In addition, each job is different from the rest, so planning

parameters are irregular. The company believes that there is no need to adopt/use an e-b/c system to improve their resource management.

### **Response to Customer (level 2)**

Customers send technical drawings via e-mail attachments (or courier-delivered). The drawings are interpreted by the Managing Director and then passed onto Fabrication section heads who break down individual component machining requirements to assess material content. This is then transferred back to the customer who will then place the order. Daily communication with customers is mainly conducted via phone, fax and email, all within office hours. Due to a long order book and limited capacity, the company often refuse to take new orders and responding to customer enquiries is not of the highest priority.

### **e-B/C Strategy (level 0)**

Business continuity appears to be the current priority, through gradual added value to their base product. The company expects to move from turnkey solutions to complete installations and commissioning, as this is viewed to be a developing business area. However, the company has no commitment, awareness and plans to adopt e-b/c. This is because the company do not want to expand too rapidly as they fear it may become difficult to control and manage. There is no intention to adopt or use e-b/c.

### **Internal Communication (level 1)**

Communication between staff is conducted face to face, by email, by 'post-it' notes or via group meetings. Communication between management is personal and intensive. Operational staff tend to execute orders from management. Communication between the Managing Director, management and the operational staff appear to be limited. The ineffectiveness of internal communication is not viewed as an important issue.

## **Appendix 6.5**

### **Company background**

It is a small company based within Frodsham Business Centre, currently employing three staff (with another post about to be filled). Annual turnover is two hundred thousand pounds. A second business premise operates from Southampton but it is unclear as to how both are connected. The business has been in operation for two and half years but only around sixteen months in its current form. The company's core business function is to provide IT support for (local) SMEs. At present, it has secured IT maintenance contracts with ten customers. In addition, ad-hoc requests for IT support are also catered for (approximately thirty customers). Software and hardware requirements can also be provided to prospective customers. Currently, the company is about to launch a Helpdesk function system, which will allow customers to track responses to their original request.

### **ICT Knowledge / Skills (level 4)**

The company are fully aware of e-b/c and its benefits. As the nature of the business is as an ICT service provider, the company has intensive ICT knowledge and skills and have the capabilities to resolve ICT problems whenever they arise.

### **ICT Infrastructure (level 3)**

The company has an integrated system, typified by a LAN (Local Area Network) that supports online trading and additionally backs up customer data. The adoption of a Customer Relationship Management (CRM) systems will be taking place within the next six months.

### **Web Marketing (level 3)**

Services are promoted in traditional and electronic format (email promotion). The company are also involved with some web marketing, e.g. advertising in electronic Yellow Pages (Yell.com). As a result, numerous enquiries have emerged. Currently, the company is about to

adopt a MS CRM system, which can interface with MS Outlook. The proposed system is not CRM in the sense of gathering customer data but actively “managing it”.

### **Website (level 1)**

The company has a website with e-mail facility, which publishes up-to-date information on the company products, services and contact information.

### **Resource Management (level 1)**

A long range planning, based on view of business direction exists. Currently, no systematic short-term planning and control is in place. The Managers’ time and response to customer requests is based on diary loading (shared and electronic based) and an “honest” view of when a job can be taken on.

Orders are made on an ad hoc basis using traditional purchasing methods; there are no signs of “e-business” activity apart from using e-mails for ordering. No supplier management activities of any substance exist. There is no current need for an e-b/c system within resource management.

### **Response to Customer (level 2)**

Customer service is considered to be the most important factor to the company. Therefore a quick response to customer enquiries is critical. Enquiries are mostly answered by telephone, email and face-to-face communication. The business is still small enough for an informal and personal approach to customer service. At present, the company does not measure customer satisfaction in any structured way.

Ideally, the company hopes that all customer enquiries will be answered by their website or e-b/c system at any time in the future.

**e-B/C Strategy (level 3)**

The company rank customer service as their number one business priority, followed by marketing. The company realises the benefits that e-b/c could bring into their business and are willing to explore the possibilities. The company has realistic goals and a clear vision of what is required. They are developing an e-b/c system with an adopted plan based on prioritised business areas.

**Internal Communication (level 2)**

As there are only three staff within the company, internal communication is less of an importance within the business operation. Staff communicate face-to-face, use email and phone/fax. In addition, all staff can work remotely.

## **Appendix 6.6**

### **Company background**

The company was established in 1976, and currently employ eighteen people with an annual sales turnover of approximately seven hundred thousand pounds. The company's design and manufacture high quality temperature sensors (pyrometers and thermocouples) for a wide range of industrial sectors, e.g. Aerospace, Pharmaceutical, Glass, Chemical, Medical, Steel, Domestic Appliance and Motor Vehicle Industries. Minta also supplies a range of quality approved temperature sensors for many unique applications in engine development and testing. The work involved is highly skilled.

The company has been BS EN ISO 9002 accredited since 1988 and are now approved to BS EN ISO 9000:2000 (An internationally recognised high quality standard for the engineering products) within their internal Integrated Business Management System. It has built up a strong customer base, both domestically and internationally. An excellent reputation has been achieved based on the company's responsive, customer driven approach to developing and manufacturing innovative cost effective solutions for temperature measurement and control applications.

### **ICT Knowledge/Skills (level 4)**

The company are fully aware of e-b/c and its benefits and possess reasonable ICT knowledge and skills. The MD manages the day-to-day ICT issues acting as an in-house ICT expert. For larger developments, external IT contractors are brought in.

### **ICT Infrastructure (level 3)**

Office PC's are highly integrated, and are linked to their own internal network server as a Local Area Network (LAN) is already in place. Within their new facility, the company has installed a new computer network system complete with new software, and a new telephone system with

high speed broadband capabilities. Not only does the ICT infrastructure allow internal file sharing, but also supports their e-b/c activities.

### **Web Marketing (level 1)**

To deal with potential new customers, the Marketing team in the company mainly deal with its customers face-to-face or by telephone. The company is actively involved in traditional marketing. However, their website is currently being developed with a view to increasing brand awareness and product/service promotion.

### **Website (level 3)**

The company's website publishes up to date information on company products and services and also facilitates an online purchase facility which includes transaction processing. The company is enrolled with EXOSTAR (e-trading hub for aerospace & defence manufacturers to develop compliance best practices) and the company is listed on their database. To compliment this, a specific INGENICO (a software to provide small payment services to merchants) terminal for purchase card transactions is fully operational. EXOSTAR registered companies are now able to place secure purchase orders via the company's website.

### **Resource Management (level 2)**

The company has approximately three hundreds approved suppliers but only use thirty to forty on a regular basis. They currently have an ongoing project to reduce their supplier numbers. Customer ordering frequency is regularly monitored via an Excel spreadsheet. Purchasing materials is conducted via the internet and telephone, based on regular stock and sale review using capacity planning techniques. Stock control is monitored and recorded via an Access database.

### **Response to Customer (level 2)**

The company views Customer Relationship Management as critical. Customers are regularly contacted by phone or e-mail. The majority of enquires are mainly dealt with via phone/fax/email during office hours.

**e-B/C Strategy (level 3)**

The company are fully aware of the benefits of e-b/c and have already adopted some e-b/c applications, mainly in Sales and Purchasing. The company hopes to continuously improve business performance in Sales, Marketing and especially in Customer Service. Therefore, the company is willing to adopt e-b/c to improve business areas of highest priority according to an adopted plan.

**Internal Communication (level 2)**

Staff within the company, mainly communicate with each other personally, by email or by 'Postit' notes. Certain staff members have been granted permission to access the company's information remotely.



## **Appendix 6.7**

### **Company background**

It is an independent small hotel based in Bootle, began trading in 1989. The hotel currently employs fourteen staff with an annual turnover of three hundred and fifty thousand pounds. The hotel can occupy up to fifty beds at any one time (between twenty to twenty-five rooms) and average occupancy rate is approximately sixty eight Percent. Compared to the occupancy rate of fifty eight percent for an average city centre based hotel (according to the hotel's managing director Ros), it is feasible to argue that the hotel is a business success. The main apparent reason for this success can be pinpointed to their high quality customer service which has meant good customer retention rates and positive 'word of mouth' advertising. Approximately, a third of existing customers return to the hotel and make repeat bookings. The company aims to continuously improve its customer service and current initiatives include a shuttle bus facility to Liverpool city centre, an airport pick up/drop off service to Liverpool Airport and various reward incentives for loyal customers. All of these customer care strategies enable the business to continuously grow.

### **ICT Knowledge/Skills (level 3)**

The company is fully aware of the benefits that e-b/c could bring to the business, especially in Sales, Marketing and Customer Service. Staff are already familiar with a wide range of e-b/c applications and this includes updating website content, the use of discussion boards and analysing customer needs. Daily e-b/c activities are conducted solely by staff members but contracted external support is used when any unexpected ICT problems occur. In addition, the company employs ICT students to inspect the hotel website. Certain students from Business Bridge of Liverpool University were on the development/implementation projects for the company's existing system

### **ICT Infrastructure (level 3)**

A Local Area Network (LAN) is currently in place. The integrated system supports key e-b/c and business activities, typified by CRM (Customer Relationship Management) and SAGE (an accounting software). CRM receives and responds to certain customer requests. SAGE is used for preparing accounts and supplier payment. A wireless network within the hotel, provides customers with free internet access. The infrastructure also provides a supportive platform for further implementation and system integration.

### **Web Marketing (level 4)**

Being purely service orientated, the company recognises marketing as a key success factor. A wide range of online marketing activities is currently in progress. These include pay-per-click, search engine promotion, banner exchange and online-discussion with potential/existing customers. In addition, the company are actively involved in e-collaboration, which enables them to generate extra sales through other organisations such as Activehotels.com and the English Tourist Board. As well as online promotion through web marketing, email promotion and traditional promotional methods are also employed.

### **Website (level 3)**

The company website ([www.regentmaritimehotel.com](http://www.regentmaritimehotel.com)) is currently maintained in-house. Originally built with Liverpool John Moores University (LJMU) assistance (Business Bridge) and local web builder MBL, the website features the company's products/services and contact information. In addition, a fully functional online purchasing system is included. It allows customers to book, amend and pay for their accommodation online. Although the website is functional, it is basically a stand-alone system that lacks flexibility. The company is unable to change the initial database (fixed price and availability of the hotel's rooms). Another drawback is that latest promotions cannot be displayed on the website. Consequently, the revenue generated via the website equates to approximately two percent of total revenue. In the short term,

it is difficult for the company to solve this issue, therefore, expansion of sales channels is the only current solution to enable the company to grow.

### **Resource Management (level 1)**

A visual stock replenishment method is employed to order all food and beverage items. The hotel bar does have a till recording system (records each purchase by item, and decrements stock) but this is currently not being utilised. Orders are normally conducted by e-mail and emails are checked on a regular basis. Overall, the company does not regularly review demand and resource balance. Resource management is not viewed as a priority, therefore the company sees little value in implementing an electronic e-b/c system to manage resources.

### **Response to Customer (level 4)**

Customer service is viewed as the most important success factor to the company, therefore responding quickly and efficiently to customer enquiries is vital. Customers can book online via several main e-booking systems (Activehotels.com and English Tourist Board) and also via the hotel website. Each website has an electronic feedback facility which the company actively trawls for customer suggestions and comments. In addition, an in-house feedback system (via departure cards) is also in place. Such techniques have created a customer base which generates thirty three percent repeat businesses, with a mixture of businesses and private customers. Repeat customers are rewarded with “free rooms”, discounts, complementary drinks from the hotel bar and ‘special food provisions’. All this clearly depicts a CRM system in place. The majority of customer enquires are answered by email, phone and fax, depending on customer preference.

### **e-B/C Strategy (level 4)**

As the company is totally service oriented (no physical product), e-business techniques are used to market and stimulate business growth.

Electronic booking systems are now well established on two of the largest public portals for hotels. Although, these portals demand a commission of ten percent and fifteen percent respectively, this was felt to be justified as the volume of business generated was significant. The use of CRM techniques to generate repeat business is fundamentally sound. Overall, marketing and customer service are the main current priorities. Based on the company's awareness of e-b/c, not only do they have e-b/c goals but also seek to continuously improve and expand their e-b/c activities in accordance to an adopted plan.

### **Internal Communication (level 2)**

It appears that internal communication is less important than communication with customers. The company believes that an e-b/c system will not prove to be cost effective. They are content with existing methods of face-to-face communication and the use of email, phone and fax. A wireless network is in place for staff usage.

## **Appendix 6.8**

### **Company background**

The company provides “e-commerce solutions”, providing an electronic facilitation service between buyers and sellers (B2B) at the SME level. At present, the company employs five employees and annual turnover is negligible. The company uploads product information from sellers onto their own server, allowing the seller’s agents to demonstrate an electronic catalogue to prospective buyers via a hand held mobile device. The long term aim is to provide stock availability information direct from the seller’s website with a view to attract buyers via portals and increase awareness of how the technology works. The business generates revenue by charging a nominal commission per sale transacted. The company initially targeted the toy industry to roll out the new technology, and are currently in discussion with numerous sellers/buyers. The company are looking to become a portal for buyers and sellers for different market segments using the same basic technology and business idea.

It is arguable that this company will not provide sufficient insight for e-business success factor research, since it is neither a buyer or a seller in the classic sense.

### **ICT Knowledge/Skills (level 4)**

The company has in-house ICT expertise, who resolve daily ICT problems, maintain the system and develop/implement new software.

### **ICT Infrastructure (level 3)**

The company has an internal server, which links all PCs within the company. The ICT infrastructure allows file sharing internally and also backs up customer data. The company website is currently being developed (used mainly for publicity purposes) and is yet to reach completion.

**Web Marketing (level 2)**

Marketing is critical to any service company. Tradeasi is an e-commerce solution provider, therefore, they pay search engines to “leapfrog” search output results. They also employ traditional methods to promote their services. Currently there is combination of web marketing and ‘word-of-mouth’ advertising. The marketing team deals with potential/existing customers mainly through personal networking and trade shows and internet advertising through partners. Customers are also approached via phone, email, electronic catalogue and trade exhibitions. The company is aware of the benefits of web marketing and they currently developing more web-marketing strategies.

**Website (level 1)**

A website exists (currently inactive), which publish up-to-date information on company products/services/contact information. However, online ordering is not supported.

**Resource Management (level 0)**

The company does not regularly review demand and resource balance, which is irrelevant at present, given the age/position of the company. Purchasing activity is negligible at present; the computer server is the only item that has been purchased. Resources are easy to manage at present as the company is service based with approximately ten customers. Tasks are managed on an “ad hoc” basis amongst a loose management structure. Resources that need to be managed include employee time allocation to customer accounts. The company employs a Data Manager at present to “manipulate” data to fit format of interface. The company also uses SAGE (a business management software) to manage resources.

**Response to Customer (level 2)**

The company currently has ten customers. Customer enquires are typically answered by phone/fax and email. The relationship with customers and quick response to emails are identified as critical for

success. Based on the company's current business position and the amount of customers, any investment in ICT or e-b/c may increase the price to customers and is therefore not cost effective. CRM appears to be a long way away.

#### **e-B/C Strategy (level 1)**

The company realises the benefits that e-b/c could bring into their business, and are willing to explore further possibilities. The service provided, is a platform for selling technology to customers (streamlining seller/buyer interface for smaller companies). Marketing becomes most critical to the business and is one of the priorities that they are aiming to succeed in, in order to stimulate business growth through technology exploitation. However, the intended development has yet to be agreed between different departments within the company. In addition, no goals/plans exist at present because of company's business position.

#### **Internal Communication (level 2)**

Staff mainly communicate with each other personally, use email or 'post-it' notes. Certain staff members are allowed remote access to the company's information remotely when required.

## **Appendix 6.9**

### **Company background**

The company is originally established in 1873, the current company owner's father took over the company in 1927. The company specialised in protective clothing in the 1960's and moved to purpose built facilities, comprising of offices, manufacturing and warehousing in Dryden Street in 1971, the same year the company became a limited company. Expansion led to the acquisition of a further 10,000 sq ft of warehousing space together with additional offices. The company remains family owned with the current generation joining in the late 1980's. Currently they are based in Liverpool, employing twenty-five staff and have an approximate turnover of two Billion pounds. They are primarily a telephone sales and e-b/c based organisation taking the opportunities presented by new communication technologies and centralised distribution whilst combining these with the traditional service ethos of a family run company.

The company offers a wide range of health and safety products. Their main area of expertise was in gloves but they have extended the product range through their own manufacture, importing and distributorships to include clothing, headgear, face, eye protection and footwear.

### **ICT Knowledge/Skills (level 4)**

The Managing Director demonstrates an excellent knowledge of ICT and is very keen to adopt new technologies. Having created, implemented and maintained the current e-b/c system, his desire is to simplify existing traditional business processes and automate these to form an integrated e-business system.

### **ICT Infrastructure (level 4)**

An e-b/c system complete with LAN: (local area network) is in place. The system is integrated with all e-b/c users including internal departments, external suppliers, customers and trading partners. The ICT



infrastructure is fully integrated and supports all business activities automatically and electronically. At present, the company continues to develop its ICT infrastructure to facilitate their new business idea as an Internet Service Provider.

#### **Web Marketing (level 4)**

Products and services are promoted via traditional methods through television, radio, newspaper, seminars, exhibitions and other PR activities. The company also run a wide range of web marketing and email promotions. Existing customers are retained because the company has an excellent market reputation and provide a high level of customer service. Web marketing as a new media channel has attracted more customers and increased their market share.

#### **Website (level 4)**

The company website (<http://www.prossor.com>), facilitates online purchasing and is efficient and functional. The online system links customer enquires directly to Sales, Finance and Administration for order, payment and filing. If the company can not supply the goods, the order is transferred onto secondary suppliers.

#### **Resource Management (level 4)**

A system is in place that links all resource information, analyses the capacity and cost and shares relevant information with customers, suppliers and trading partners.

#### **Response to Customer (level 4)**

Customer enquiries are responded directly via the company's e-b/c system. An example to illustrate this is with the company's main customer, Airbus. The company's owner has created a compliance system and integrated this with Airbus. This allows Airbus to order and purchase products at any time. The process is automatic, electronic and in real time. The system is linked to all departments internally but also

integrated with customer and supplier systems for billing, payment and filing.

**e-B/C Strategy (level 4)**

The company has identified a wide range of benefits of e-b/c. The company has successfully expanded their market share and will likely to continue growing. The Managing Director believes that their integrated e-b/c system is a key reason for their success. The vision and goals are clear, the commitment is persistent and the company continues to grow through e-b/c activities, in accordance to an adopted strategic plan.

**Internal Communication (level 1)**

Internal communication is highly efficient. A company intranet is in place, where staff are able to share business information and good practice in addition to meeting in person or by communicating by email. Remote working is also in place via the use of wireless technology.

## **Appendix 6.10**

### **Company background**

This is a long-established, specialist manufacturer of headwear was first called Alexander Legge at its formation in the 1860's. The company had expanded its product range by its new owner in 1958. It is one of the UK's leading headwear producers specialising in military uniform caps, hats and other headwear for the police, army, navy, air force and corporate uniform suppliers worldwide. In 1992, the company attained BS5750 (it is the British Standard on "Quality Systems"), making it the first British headwear manufacturer to reach this standard and has continued its quality improvements ever since. The company is now renowned for its high quality production abilities and strong brand image. This is a family business (as are most SMEs), employing approximately sixty people consisting of machinists and office staff. Annual turnover is approximately £1.8 million.

Design is usually partly in negotiation with the customer, drawing on the experience and expertise of the firm. Within the last six to twelve months, there has been a major shift towards the transfer of production to "offshore" and the emergence of a new and expanded product portfolio. Approximately eighty percent by volume is now sourced outside the UK (Poland, Czech Republic and Bulgaria). Some of this work is for finished hats (offshore manufacturer sources all components, manufactures and ships the product). The majority of offshore production requires the company to supply source materials, components, diagrams and comprehensive instructions to the source manufacturer and maintain very close contact with them during production. Due to language barriers, communication issues have emerged, requiring all communication to be simple, accurate and highly detailed.

Given the shift to offshore manufacturing, the most pressing requirement for the company is to retain sufficient control of the manufacturing process, so target production dates are met and good customer relations

are maintained. As the in-house manufacturing becomes more niche, and specialist, the company will benefit from more advanced product presentation and more sophisticated customer management and customer service.

### **ICT Knowledge/Skills (level 2)**

The company has some e-b/c awareness but limited ICT knowledge and skills. External support is required when ICT problems occur. Weak ICT knowledge is one of the main reasons as to why the company is slow to adopt more advanced e-b/c applications.

### **ICT Infrastructure (level 1)**

A simple PC connectivity (Broadband) exists, which allows internal file sharing. The company website is created, hosted and maintained by an external IT company. IT is mainly used for cost and efficiency reasons. The ICT infrastructure does not support advanced e-b/c applications and activities.

### **Web Marketing (level 3)**

The company has just become more proactive in web marketing. They have trawled through past sales orders to analyse customer buying patterns and trends and then used this information as a form of CRM. The company is now very focussed on selling their products as opposed to just 'taking orders'. Apart from traditional product promotion, the company also promotes their products and services to customers/trading partners through regular emails. Their website displays contact information as well as publishing and promoting products and services.

### **Website (level 1)**

Previously, the company had a website which was basically a catalogue. Now, the website has the functionality of allowing the customer to "design" their own hat, which the company can then convert into a specification and price. The website generates "some" custom.

Customers cannot order from the website. The level of business gained from the website is unknown.

### **Resource Management (level 2)**

Components for production orders are now driven by entry of customer order to XE Business (Business control software package) to net out current stocks and create suggested purchase requirements. These are manually verified before being issued on paper to suppliers. Manual progress update is required from a list of orders expressed by due date. Offshore manufacture (OM) progress is monitored by reference to due date. No automatic electronic progress update system is in place. Any materials sent to OM must be manually adjusted on the XE stock control module. Modules exist for XE Business to do this but the company have yet to purchase these. Finished goods now appear on XE Business. For in house (IH) manufacture, the company still use a home built capacity planning system plus work to lists as shop floor instructions. Work progress is measured by a real-time shop floor control system; a daily capacity plan update displays all incomplete jobs at the top of a list.

### **Response to Customer (level 2)**

The company now meet eighty percent to ninety percent of orders on time, mainly as a result of lower business levels and also partly due to reduced order complexity. The in-house capacity planning and control system monitors job progress but tends only to be checked when customers enquire about their order progress and is not performed routinely. Orders are placed via e-mail, post, fax, etc. No form of electronic ordering exists because there is no pressure from customers to adopt a more advanced application such as online-ordering. Customer enquiries are typically answered by email within and out of regular office hours.

### **e-B/C Strategy (level 2)**

The company realises the benefits that e-b/c could bring into their business and are willing to explore the possibilities, especially in Sales.

The company currently use an e-business control software system called 'XE Business', which is an industry standard package. Primary e-business aim is supply chain control. The company would like to increase revenue as well as improving communication, marketing and customer service by using e-b/c within the next year. Although the company has clear vision of what to do next, this has yet to be executed

**Internal Communication (level 2)**

Communication between staff is conducted personally, by email or by 'post-it' notes. Certain staff are allowed to access the company's information remotely through wireless technology.

## **Appendix 6.11**

### **Company background**

The company produces multi-wall paper sacks and corrugated cardboard boxes, die-cuts and fitments. The company consists of two separate companies. They remain a family owned and family run company, which is now in its sixth generation having been founded in 1837. The company is accredited as an ISO 9002 (quality assurance certificate) company. Currently, the factory is based in Bootle, Liverpool, employing forty staff and with an annual turnover of £3.5 million. Two thirds of the revenue comes from the paper sack division, which now supplies all sectors and is the leading supplier to the milling industry. To achieve all this, concerted efforts have been made with product quality and speed of response as they are seen as key factors. The corrugated box division continues to expand due to its quality service provision.

### **ICT Knowledge/Skills (level 2)**

The company has an in house IT department, possessing some basic ICT knowledge and skills and ICT problems are solved on an ad-hoc basis. Overall, the company has some awareness of e-b/c but are unsure how the prospective system could be of use. The company believes ICT knowledge and skills are valuable but are concerned about the time, cost and commitment required to achieve this. They hope to explore the benefits of e-b/c only if costs are manageable.

### **ICT Infrastructure (level 0)**

Stand alone PCs with broadband internet connection are in place. Currently, there is no integration within the ICT infrastructure. Integration is highly desired but again, cost is a main concern.

**Web Marketing (level 1)**

The company promotes their products and services mainly through television, radio, newspaper, seminars, exhibitions and other PR activities. No form of web marketing exists. The corrugated box side of the business is much more fragmented. There are in the region of 400-450 competitors, including most of the high volume corrugated board manufacturers. It appears that the business heavily relying on repeat customers and are faced with the difficulty of expanding their market without the use of web marketing.

**Website (level 1)**

The company has a website, which is created, hosted and maintained by an external IT company. This is just a web presence for publicity purposes. No form of electronic ordering is in place.

**Resource Management (level 1)**

The company has limited regular suppliers from Scandinavia and Portugal. Good relationship and trust between the company and its suppliers have established through repeat orders. Materials are purchased via phone/fax. The company believes an e-procurement system is unnecessary. A form of annual sales forecast review against overall capacity is in place, which informs sourcing decisions. The process is reviewed on a quarterly basis. It appears that no regular Sales and Operations Planning reviews exist. Informal discussion takes place when large, urgent or unusual orders are placed especially when resource problems (machine capacity, labour availability, etc) occur. For paper, the material control process is very informal. Paper stocks are manually monitored against "expected" or "average" demand. Stock control is based on the Chairman's knowledge of the market and purchases the materials accordingly. The company are concerned about the cost of implementing an electronic capacity planning system and believe the cost outweigh the benefits.



### **Response to Customer (level 2)**

The company has approximately two hundreds UK based customers, with the usual Pareto type distribution of approximately twelve customers dominating the company's business volume. Orders are received by phone, fax and email. No electronic forms of ordering exist. For some customers, no written order confirmation is sent following a phone order; therefore the customer is relying on the company to accurately capture the order. Orders are ninety five percent plus repeats of an earlier order. All customer enquiries are answered via phone, fax or email within office hours which can prove to be a slow process, subsequently making customers increasingly frustrated. This makes the business less attractive than it should be.

### **e-B/C Strategy (level 1)**

The company is aware of the increased competition in the market and are willing to explore the benefits of e-b/c. However, no plans or objectives exist. Other concerns include cost effectiveness, ICT knowledge/skills, adaptability of changes, ICT infrastructure and implementation. All these factors prevent the company from moving forward.

### **Internal Communication (level 1)**

Staff communication is mainly conducted in person, by email or by 'post-it' notes. Staff are unable to share information electronically nor have the option to work remotely.

## **Appendix 6.12**

### **Company background**

They are British designers and manufacturers of heat sealing equipment. All their products are designed and built in Britain. The company was founded in 1963 and is still family owned. The business moved to a purpose built factory in Knutsford, Cheshire in 1993 where they have state of the art design and manufacturing facilities. The company employs over 200 people, with an annual turnover of seven Million pounds. The company provides heat sealing solutions for a vast array of applications in the food, medical and cosmetics sectors. Production includes packages, yoghurt containers and plastic inserts with a sealed film element. The company also manufactures sealing equipment tools. Customers are mainly UK based, but the company are trying to reach more customers on a global scale.

### **ICT Knowledge/Skills (level 4)**

The company is fully aware of how e-b/c could be beneficial to their business, especially within marketing. An in house IT department is in place, which brings numerous advantages, and benefits current e-b/c applications and any future implementation.

### **ICT Infrastructure (level 2)**

A basic internal network server is in place connected to a LAN, (Local Area Network). High speed broadband connection is also in place. A company intranet service is currently in the experimental stage. The system is integrated, albeit in a basic form, to support their current e-b/c activities.

### **Web Marketing (level 4)**

Marketing is an area which the company is very much focused on. The company is fully aware of the competition in the market and how they could be a threat to the business unless they remain competitive. The company promotes products/services through their website and also run

a wide range of web marketing campaigns (online customer survey, electronic brochures, regular emailing to customers, promotion on third party websites, a variety of search engine promotions and ranking campaigns). Traditional marketing promotions are still used to complement web marketing because of certain customer requirements. The company aims to develop their marketing via the web as they believe that this form of marketing help to reduce admin costs.

### **Website (level 1)**

The company has a website, which is hosted by an external company called mailbox. The company believes that it is more appropriate for an external company to support the website so that they can remain focused on strategic matters rather than operational issues. The website has a user-friendly interface for both potential and existing customers. Existing customers can log into their personal accounts and potential customers are able to access detailed product specifications. However, the website does not support online ordering or purchasing. The web pages are comprehensive but it is more akin to an electronic brochure and non e-b/c oriented. This is because it is deemed as unnecessary, since customers tend to order bespoke systems.

### **Resource Management (level 1)**

Designers need to manually input their product designs into the system. Based on this information, the company then has to decide which components can be manufactured (by the company) and which components must be purchased from their external suppliers. The company generates the components that are required and the system decides on the purchasing list. The purchase list is then transferred onto the Purchasing department. They typically print the purchasing order, file one copy and then fax or post a copy to the suppliers. The biggest problem for the company is that they are unsure when they might need to purchase these components. The stock control system in use, 'SWAN' (old system soon to be replaced), does suggest what is in stock/not in stock, and generates a purchasing enquiry if they have the item in stock.

However, the system is not integrated with their supplier's system. The company still need to contact their suppliers to solve any unexpected issues that may occur. The company is concerned about the labour intensiveness, unnecessary complexity and stationary cost in the purchasing process. Therefore, they are exploring new methods to improve the purchasing process. The company hope to email their orders electronically, possibly via a new ERP (Enterprise Resource Planning) system to simplify the business process as it is currently being manually processed. Integration of resource management is still a long way away. The company believes that maintaining a good working relationship between the company and its suppliers is important, implying that technology cannot totally replace human interaction.

### **Response to Customer (level 3)**

Customers typically call for support and enquiries are immediately answered by onsite engineers. The company has a policy of replying to customer enquiries within 24 hours. The website has a personalised customer service for each customer which allows them to log in and submit any enquiry. Because of the nature of their customers and the products/services that the company offers, customer enquiries are more likely to be answered by humans rather than in an electronic format.

### **e-B/C Strategy (level 3)**

The currently business priority is integration through the acquisition of a new ERP system to simplify the purchasing process. The company also wishes to adopt online ordering for its existing customers within the next eighteen months.

### **Internal Communication (level 2)**

It appears that internal communication is less important than other prioritised business areas. Staff communication is conducted personally, by email and by phone or fax. The company actively supports mobile working. Certain staff are able to access company information remotely. Typically, Service engineers benefit from mobile working.

## **Appendix 6.13**

### **Company background**

The company was formed in 1997 by creation of a joint venture. Later, it merged with Hoechst (company created named Aventis) and then acquired by Sanofi Synthelabo. It is a provider of products and solutions that enhance the health, well-being and performance of animals. The company employs over six thousand people worldwide and operate in more than one hundred and fifty countries. The last reported sales turnover (2005) was in excess of £1.9 billion. The UK Head Office is located in Harlow, which employs forty five staff, plus an additional thirty sales staff.

The company provides a comprehensive range of products to enhance the health, well-being and performance for a wide range of animals. Applications include: anaesthetic, antiparasitic, antimicrobial, gastrointestinal, respiratory and cardiovascular medicines. The company plays a pioneering role with governments around the globe to contain and manage various animal diseases; recognising that the prevention and cure of animal diseases are in the interests of protecting the health of animals and mankind. Customers include veterinarians, pet owners, farmers and food animal producers worldwide. Generic products are sold across many different countries and are sold through prescription only.

The company cannot be classed as an SME, although the business unit based in Harlow would qualify on employee numbers. They are part of a very large multinational, with (anticipated) high level of corporate resources. The company is able to take a proprietary business control system and have it "adjusted" to meet exact requirements. The control of global logistics must be close to, if not at, state-of-the-art, which is to be expected from such a large, profitable, well-managed organisation. It is assumed that global manufacture is continually being optimised around aggregated demand from all local sources, and manufacturing costs are

traded off with stockholding and transportation costs to create an optimum balance. The usual third element in this equation (customer service) is probably not very important, since it assumed that with such high margin products, there would be little point in risking customer service through trying to squeeze stock levels down too far.

#### **ICT Knowledge/Skills (level 4)**

The company is at the cutting edge of utilising the internet to meet the changing needs of their customers. The company employs staff dedicated as e-b/c specialists, working in conjunction with business units to develop and implement e-b/c strategies. The goal of their e-b/c group is to understand the needs of their customers and provide innovative on-line solutions that meet these needs.

#### **ICT Infrastructure (level 4)**

The ICT infrastructure is highly integrated, typified by a WAN (Wide Area Network). The network links all computers within all branches, using high speed broadband connection and Extranet. The ICT head department is based in the United States. Currently, the system is highly integrated and supports all their current e-b/c activities. The ICT infrastructure is able to support all business activities automatically and electronically when fully integrated.

#### **Web Marketing (level 4)**

The UK Sales team conduct calls during events to maintain product awareness. Product managers are empowered to update information but the speed and detail level of this is variable. The company runs a wide range of products/service promotions through their website. In addition, the company struck a number of alliances with internet based companies. These alliances complement the company's business strategy and allow them to communicate to their audiences through new and exciting initiatives. In the United States, they have created partnerships with DirectAg.com, the leading online destination for agricultural producers

and AgSpan.com, an innovative matchmaking company, which utilises Veterinarians and the internet to bring cow calf producers and feedlot operators together. In France, the company has created an alliance with Aniwa.com, a site dedicated to bringing pet owners and professionals, a complete and interactive knowledge of small animals. The company may run a wide range of marketing campaigns both globally and regionally, but they still face issues including system implementation, elevation, limitations on time and resources and measuring the impact and benefits of the results.

### **Website (level 1)**

The company created a global website that provide a multitude of options such as product and technical information, interactive tools, business-to-business commerce and other unique features. Each branch within each different country has a regional website. The company's UK website is the website for the UK Head Office, which is maintained by a third party. The website is used to provide product details, clinical information and product updates. It is also used to present a corporate "front" for the company. In the future, the company hopes to develop their website for corporate and product information followed by development of electronic transaction systems (e-commerce) because they believe online commerce is a key component for a successful business. Speed, accessibility and simplicity are the key elements of company's future websites, allowing customers to order products, track their orders, access their account information, and retrieve historical order information. All of these features will be available at any time.

### **Resource Management (level 4)**

The UK branch forecasts the stock through their internal system and then purchases materials directly into the UK warehouse. All mainstream products are sourced from fifteen manufacturing units around the world. Finished product stocks are held in a contractor warehouse according to stock targets. As stock is consumed, replenishment requirements are calculated by GPS and (presumably) aggregated in a company wide

business control system with other countries' requirements, and become the input for production planning and raw material control at the appropriate production site. A system called 'E-Room' is in place and is used for electronic communication between sales, marketing, product development, manufacturing, etc. Product launches, revamps are controlled via project management software, with controlled access by all necessary personnel at any location.

#### **Response to Customer (level 4)**

Contractor delivery performance is monitored on-line. Invoices for deliveries are created and transmitted to customers simultaneously with release of despatch instructions to the contractor, so there is a possibility that the invoice arrives before the goods. The company has a customer care centre to deal with customer enquiries in addition to the "e-room" help function which answers customer enquiries online. Customers (actual and potential) can access the corporate site for product information and raise queries electronically through the CRM system.

#### **e-B/C Strategy (level 4)**

The main driver for e-business activity was to facilitate business process improvements, with secondary driver being creation of a website to project corporate information. The former driver was principally aimed at placing planning and control of stocks, replenishing orders to manufacturing sites, control of deliveries to customers (warehousing & distribution done by contractor) on a fully integrated electronic system. More recently, analysis of customer information from sales records is now being actively managed by CRM software. It is clear that the company is executing e-b/c activities in accordance to an embedded plan (3 years cycle). The company has the most complete internet offerings in the animal health industry. Communication and marketing are the current business priorities and they aim to continue investing in this technology to add additional features and benefits to their website. This will provide



customers with the information, tools and services necessary to make more informed decisions.

**Internal Communication (level 3)**

Communication between staff is conducted personally, by email and by phone and fax. Staff are also able to communicate and exchange information through the company Intranet. In addition, the company encourages mobile working. Video conferencing is regularly used between different branches to save on travelling costs.

## **Appendix 6.14**

### **Company background**

This is a service based limited company (formerly Corinthian Insurance), which trades only with intermediaries. It commenced trading in 1964. Since then, the company has held a good reputation for quality and service (different insurance products/policies). The Head office is based in Barking, Essex, employing 350 staff with claims offices in Norwich and Birmingham. The company offers a wide range of products, each of which are niche and specialist in their own right and each with its own policy document and experienced underwriting team. The underwriting products operate as separate insurers, each with their own agency base.

### **ICT Knowledge/Skills (level 4)**

The company is fully aware of how e-b/c could be beneficial in every aspect of their business. In-house ICT expertise is available to resolve general ICT problems. In addition, external contracted ICT expertise in specialised areas is also available. The ICT knowledge and skills available are used to support every e-b/c activity. Furthermore, the company is willing to explore and use new inventions.

### **ICT Infrastructure (level 4)**

The ICT infrastructure is extensive and fully integrated, supporting all business activities automatically and electronically. The ICT infrastructure is fully integrated, typified by a LAN (Local Area Network), Extranet, CRM system, EDI (electronic data interchange) and other business systems are also used. The company believes that an integrated system makes a significant difference to the business. Any software/technology in use must be flexible enough to enable it to drive e-b/c for a business as opposed to driving a business to fit into a form of ICT infrastructure.

#### **Web Marketing (level 4)**

The company is fully aware of the benefits of web marketing, helping them to promote and consolidate their brand image. The company actively promotes its products, services and image via numerous traditional methods including TV advertising, direct mail, seminars, exhibitions and PR. The company also run regular email promotions and a wide range of web marketing campaigns through their own website and other third party websites. These web marketing campaigns include pay-per-click, search engine promotion, web seminars, banner exchange, online-discussion and virtual communities.

#### **Website (level 4)**

All product and service information can be accessed through both national and international websites, which supports all business activities including online purchasing. As most orders are now being purchased online, this has helped to significantly reduce costs. Consequently, the company is in a position to offer competitive prices. The company's websites are state of art and are fully functional and highly integrated, linking them with their trading partner systems. It appears that the industry is mature and e-collaboration is vital. Without a sophisticated website, success would be difficult to attain.

#### **Resource Management (level 4)**

As insurance products/policies are only being offered, there is no requirement to obtain raw materials. A policy document is required for each customer and this can be emailed or sent via post. Other suppliers that provide daily admin items are effectively managed through a centralised purchasing department, all conducted electronically.

#### **Response to Customer (level 4)**

The company operates multi-channels to respond to customer enquiries because customer service must satisfy diverse needs. The company has identified that customers aged between forty to sixty mainly call for support. The under forty and people aged sixty and over normally use

the online system for purchasing or enquiring for information and support. The company is able to answer customer enquiries through their e-b/c system or via website, email, phone or fax. The system is designed to quickly respond to customers and to minimise human input. However, manual human intervention is still required to implement the system because of the complexity of the customer service on offer. The e-b/c system is also able to store customer information, classify different customer needs and analyse buying patterns. All of this helps to accelerate the process of responding to customer enquiries.

#### **e-B/C Strategy (level 4)**

The company believes their success is based on providing a high quality service and adherence to numerous policies namely; trading through brand names, right products for targeted markets, electronic trading, gathering data from customers, working with partners, collaboration, making customers to reach the company. Information is vital to make a business succeed and e-b/c should be designed to achieve all business goals for success.

The company currently has three ongoing e-b/c strategies:

1. encouraging cheaper deals through the internet via their own website
2. to achieve a paperless working environment in order to save costs
3. continueing to explore and invest new technologies to fit into the business (which must be cost effective and profitable)

The company is aware of the fast changing of new technologies and the competitiveness within the insurance industry. E-b/c is essential for the company and it is apparent that they are executing e-b/c activities in accordance to an embedded plan.

#### **Internal Communication (level 4)**

Internal communication is extremely efficient. Through their e-b/c system, the company is able to check on all new business and other

business activities in detail. Staff are able to work remotely; wireless devices are regularly used. All e-b/c users are able to communicate with each other effectively through email, website, Intranet/Extranet.

#### **KEY SUMMARY NOTE**

The business process is done automatically and electronically. The company's e-b/c systems helped to save costs, to attract new customers, to provide real-time customer care and to increase revenue.

## **Appendix 6.15**

### **Company background**

The company was established in 1846. It was the first outside the United States to exploit leading edge telegraphy technology and introduce electrical communications on a global scale. The company is one of the world's leading providers of communications solutions serving customers in Europe, the Americas and Asia Pacific. Its core business activities (telecom retail, global service, wholesales, Openreach and exact) include networked IT services, local, national and international telecommunications services and higher-value broadband and internet products and services. In the UK, BT serves more than 20 million business and residential customers with more than 30 million exchange lines, as well as providing network services to other licensed operators.

Broadband is the biggest opportunity for growth in the communications market and as part of the Government's Broadband Britain initiative, the company has taken the lead role in providing broadband accessibility, resulting in 99.9% UK broadband coverage. One of their key priorities was the delivery of broadband through the support and creation of highly valued public and private partnerships. The company is involved in an active programme of partnerships and programmes across all regions, which has had successful impact on the growth of regional economies. With almost 431,800 people employed directly and indirectly by the company in the UK, the company makes a substantial contribution to the national economy. The company's activities support almost 1.7 per cent of all employment in the UK, a considerable contribution for a single company. As well as employment and investment, the company provides significant support in areas of UK business, local communities, sports and the arts through direct funding.

#### **ICT Knowledge/Skills (level 4)**

The company is fully aware of how e-b/c could be beneficial to every aspect of their businesses. All offices have in-house ICT expertise, who fully support all current e-b/c activities, solving ICT problems and also contribute to the continuous implementation and development of the company e-b/c system.

#### **ICT Infrastructure (level 4)**

The ICT infrastructure is extensive and fully integrated, supporting all business activities automatically and electronically. The company believes that a ICT infrastructure is fundamental to the success of the business and are willing to explore new technologies.

#### **Web Marketing (level 4)**

The company is fully aware of the benefits of web marketing. The company actively promotes its image, products and services via numerous traditional methods including TV advertising, direct mail, seminars, exhibitions and PR. Regular email promotion is also conducted. Web marketing acts as a new media channel to generate new business for the company. Web marketing campaigns include pay-per-click, search engine promotion, web seminars, banner exchange, online-discussion and virtual communities.

#### **Website (level 4)**

The company has a comprehensive and highly functional website, which supports all business activities including online purchasing. The website is a core capability that has strengthened their competitiveness within the market. Through the website, customers are able to view their personal account and bills, place, amend and track orders and view and download their inventory. Customers can now even conduct testing online. The website is personalised to individual customers according to their needs. Overall, the website has generated additional revenue for the company and has improved overall efficiency. The company also has an age and

disability website, which provides accessible communications solutions for older and disabled customers.

#### **Resource Management (level 4)**

An e-procurement system exists (an Intranet site) and is directly integrated with their suppliers. The system allows staff to purchase everything from stationery items to flight tickets. The system is highly integrated with other departments such as finance and administration. At present, there are hundreds of different applications currently being developed to improve business process.

#### **Response to Customer (level 4)**

The company has approximately 4,000 corporate clients to which they offer various services from basic supply through to total outsourcing. This is performed at four levels:

1. Face-to-face
2. Desk - Integrated customer service
3. Web
4. Partner

The fundamental aim is to help customers to achieve their objectives. This is underpinned with core CRM strategy to capture all customer information and assets. The customer is fully supported in all aspects. Enquiries are responded to by the company's e-b/c system. In the short term this was developed by taking what they already had, and force fitting it to the customer's needs. Longer term will be customer driven, the motivation for all this is the customer's own control.

#### **e-B/C Strategy (level 4)**

Although the company offer a high quality self-service to their customers, the service would be unlikely to satisfy customers, who want to purchase a large volume of products or services. Based on not giving up the core capability online, the next e-b/c strategy is to build one stop shop real-time customer service systems. The system will simplify customer



orders, payments and after sales services automatically and electronically. Problem resolution, enhancement, up-skilling and sales campaigns are required to implement the system. The company has transformed from a face to face organisation and developed into an interactive organisation with core online capability. The company believes an integrated process is fundamental and technology is critical for all channels to integrate. They hope to achieve online transaction in the future. The company also aims to focus on customer needs and to design the channels for them. CRM strategy is one of the priorities. The objectives were not growth but a “transaction economics” perspective e.g. reduced costs (on-line versus off-line costs) and business control and efficiency. However, it will be very difficult to provide a detailed cost/benefit analysis for MIS.

Two types of technology provision:

TASK: Provide detailed systems and monitoring

ROLE: Provide technology and let them choose how to use it

It is apparent that the company continues to execute e-B/C activities in accordance to an embedded plan.

#### **Internal Communication (level 4)**

The company views internal communication to be important as any other business area. Mobile working is beneficial to the business. Currently, staff communication is conducted personally, by email, website, Intranet and mobile devices.

## **Appendix 6.16 Fixed Factors**

### **F1: AGE**

This is an indication of how long the firm has been in business and is loosely rated on a scale of newly established (less than 3 years) as 0 to mature business (over 80 years) as 4.

### **F2: SIZE**

On this scale, a firm with less than 10 employees is classed as micro size at 0, 11-49 or so as 1, 50 to 149 or so as 2, 149 to 250 as 3, over up to 500 as 4. The exact positioning on such a scale is often difficult to fix precisely, e.g. a small division of a larger unit could be classified by the number of employees in the unit, or if the unit has access to company-wide facilities (for example ICT development) then it becomes reasonable to class the unit size larger as appropriate.

### **F3: SERVICE ORIENTATION**

This is an indication of numerous service elements in a firm regardless of the sectors. In this measure, the service element of the product is being assessed. The range varies from a totally service-based product (where there is no manufactured element, such as a hotel or a newsagent wholesaler) to a manufactured product, such as plastic bottles for drinks producers, X-ray screening equipment... It must be recognised that whilst it is possible to define a totally service based product, almost every manufactured product now has some service element associated with it. For example CORUS do not produce steel and hope someone buys it, they have dialogue with customers (both actual and potential) on matters like specification, lead time of supply, quality assurance procedures etc all of which form a service element to the whole package. The scaling of this factor is set at 0 (totally manufactured product with no service element) or 1

(manufactured product with low service element) to 4 (no physical product and totally service based company).

#### **F4: PRODUCT NATURE**

This measure attempts to classify the product according to its complexity and online selling potential (e-b/c is suitable for products e.g. books, CDs, and information etc but not normally used for complex products which are unique or which have a large number of components, processing demands or design element etc.), and the nature of its market place (uncertainty of demand, competitor profile, order qualifiers and winners, lead time pressure etc.). Clearly this is a rather loose measure but it should be able to differentiate between, say a firm that makes cheese pies for a major retail supermarket from a firm that provides dress hire for functions. The chosen scale is basic: High complexity less online selling potential as 0 to low complexity more online selling potential as 4.

#### **F5: SUPPLY CHAIN**

For any market in which the firm operates, there will always be upstream suppliers and downstream customers. The number of these and the pressures they exert have a major impact on the firm's operations. The ways in which supply chain factors work find parallels in Porter's 5 forces model. Again the scaling is not sophisticated; being on an axis of low supply chain pressure as 0 to high supply pressure as 4. The intention is to allow differentiation between, say, a firm making confectionery and supplying the retail grocery trade, and a firm fitting and maintaining security lighting equipment.

All of the factors above are to be regarded as fixed, since the firm being assessed has no influence over any of them; age is a given, size cannot be varied in the short term and the nature of the product, in its wider sense

embracing both physical (manufactured) and abstract (service) is wholly determined by the market place and the nature of the product being offered.

## **Appendix 6.17 Variable Factors**

### **V1: ICT KNOWLEDGE / SKILLS**

The firm will have a degree of internal IT knowledge/skills. Perhaps in the form of an employed specialist, or an employee with some aptitude or make use of externally available expertise, perhaps a consultancy, or a contract maintenance arrangement, or a business support agency. The extent to which the firm has or makes use of IT expertise is measured by this factor, which is based on a notional score of between 0 (company does not have any relevant ICT knowledge and skills) and 4 (knowledge/skills intensive typified by in-house ICT expertise).

### **V2: ICT INFRASTRUCTURE**

Every firm has an ICT infrastructure with different degrees of integration. The ICT infrastructure facilitates e-b/c activities and it is vital in terms of the implementation of e-b/c systems. There are many cases where ICT infrastructure has failed to support e-b/c strategy in some firms. It can also reflect the company's investment towards ICT and the commitment to e-b/c development. The degree of ICT infrastructure is measured by this factor which is based on a notional score of between 0 (no integration; company only has stand alone PCs with no Internet connection) and 4 (company has a full integrated system that is typified by CRM, ERP and other integrated business systems).

### **V3: WEB-MARKETING**

Half of SMEs fail their businesses because of inadequate marketing. Some SMEs are still not involved in any marketing activities although the majority of SMEs are keen to improve on it. The research shows web marketing can improve marketing performance and increase firms' competitiveness in the modern business environment. The method of promoting the firm is

measured by this factor, which is based on a notional score of between 0 (no marketing activities) and 4 (promoting products/services through a wide range of web marketing campaigns)

#### **V4: WEBSITE**

Although one of the government initiatives is to encourage all UK SMEs to have their own website but it is not surprising to find that there are still some firms who have no website. Even if a firm had a website, the functionality of it can be variable e.g. half of them only use the website for publishing information whilst some of them use the website for online trading. A sophisticated website can enhance the overall e-business capabilities for a firm. E-activities, especially online trading, online purchasing, web marketing and e-customer service are impossible to execute without a website.

#### **V5: RESOURCE MANAGEMENT**

Depending on the nature of the business, the firm will have a greater or lesser need to control resources. If suppliers are difficult, manufacturing processes complex, inventory requiring tight control, customers are demanding and frequently changing requirements etc., the firm will need a system to help to manage things. The extent to which this is electronic is measured by a score from 0 to 4. To calibrate this scale, a firm with more than 10 suppliers, several products, more than 10 customers, processes which require planning and scheduling, inventory which must be minimised will score highly if this is being effectively managed by an e-business process element (probably some form of business control system). Whereas a hotel needing to manage staff, replenish beer and food etc. and performing this manually would score low on this measure.

#### **V6: CUSTOMER MANAGEMENT**

On a scale of 0 (do not manage customer, all enquires typically answered by letter from the firm) to 4 (manage customers through e-business system in a

real time). A firm's customers managed with e-business process is assessed by this measure. A firm which maintains accurate data on customers (off-take, volume, profit margin, service costs...) using e-business processes, not only can this help the firm to analyse buying behaviour accurately but can also provide swift customer response and improved customer service. It might be some form of Customer Relationship Management (CRM) software, or simple downloads from a business control database scores highly here.

#### **V7: e-VISION & STRATEGY**

The extent to which a firm has developed its e-business systems is closely linked (certainly in a small firm) to the drive and vision of the owner or the managing director towards e-business and also the attitude to growth. Particularly, these factors are directly reflected on e-business strategy to a small firm because the owner/MD is the only person who has the control and the power to make decisions for the firm. If this person is highly IT literate, and/or can see business exploitation or efficiency improvement possibilities from IT, then development of an e-business approach in some form will follow. Many of the newer, service based SMEs owe their existence to an IT-capable leader. Not only have they spotted how technology can be exploited but have also driven it through to a working business proposition. The firm is assessed on a scale of 0 (the firm is happy with their current business and one is seeking to change things, no commitment and awareness towards e-business) to 4 (the firm is aiming for high growth and uses e-business technology and practices to support the growth. Owner/MD is driven by e-business development with clear views and strategies according to prioritised business needs which are wholly instrumental in creating the IT based business platform).

#### **V8: INTERNAL COMMUNICATION**

Internal communication is one of the key success factors to any firms. The ways/methods within the company varies from traditional posting notes, face to face meeting to wireless devices e.g. blue tooth, PDA etc. or even use e-business system e.g. extranet. For this factor, effective communication is assessed through the methods people use to communicate within the firm. A scale from 0 (basic traditional communication) to 4 (typified by Extranet which allow people share valuable information through firm's e-business system in real time)



## Appendix 7.1

### SME E-Business/E-Commerce Self-assessment Tool

The aim of this self-assessment tool is to:

- assess your current e-business/e-commerce performance
- identify weaknesses and strengths against e-b/c integration levels
- identify goals and priorities for e-business/e-commerce adoption or development

#### Part 1: E-business/e-commerce Self-assessment

INSTRUCTIONS: Listed below are 8 questions which are designed to identify eight different areas of your e-business/e-commerce performance. Please select one answer **ONLY** to each question which is most appropriate to your firm's status.

Questions 1-8:	Answers: My company...	(Level)
Q1: Which answer best describes the level of ICT knowledge/skills in your company?	does not possess any relevant ICT knowledge/skills.	1
	has limited ICT knowledge/skills and e-business/e-commerce awareness.	2
	has some ICT knowledge/skills but call for support on an ad-hoc basis.	3
	has contracted external support who deal with ICT issues.	4
	is ICT knowledge/skills intensive and we have in-house ICT expertise.	5
Q2: Which statement best describes the level of ICT infrastructure in your company?	has stand-alone PCs and no internet connection.	1
	has basic PC connectivity typified by file sharing.	2
	has its own internal network server e.g. Local Area Network.	3
	has stand-alone e-business applications support online business activity.	4
	has an integrated systems supports all business activities electronically.	5
Q3: Which answer best describes marketing activities and the level of web-marketing in your company?	does not participate in marketing activities of any kind.	1
	promotes business mainly through tv, radio, newspaper, exhibitions etc.	2
	mainly involved in email promotions and email campaigns.	3
	displays and promotes business information through its own website.	4
	runs a range of online marketing campaigns e.g. search engine promotion, banner exchange, online-discussion & virtual communities.	5
Q4: Which statement best describes your company's website function?	does not possess a company website.	1
	publishes up-to-date business information on its website.	2
	accepts customers' orders or modification of existing orders online.	3
	facilitates customers' purchase online including payment transactions.	4
	website links suppliers' or internal operational systems automatically.	5
Q5: Which answer best describes your company's resource management systems?	does not regularly review demand and resource balance electronically.	1
	manages resources manually.	2
	uses stand-alone systems to manage resources.	3
	uses simple integrated e-technology or software to manage resources.	4
	a system links/shares all resource information with all parties involved.	5
Q6: What are the primary methods to contact and respond your customers enquires?	responds to customers mainly by letter/mail.	1
	responds to customers mainly by letter/mail and phone/fax in office hours.	2
	responds to customers mainly by email within and out of office hours.	3
	responds to customers mainly by its own website at anytime.	4
	answers customers' enquires in real time via e-business systems	5
Q7: Which statement best describes your e-vision and strategy to e-business?	has no strategic intentions, awareness or plans of e-business.	1
	is willing to explore the benefits of e-business but without goals and plans	2
	has an intended plan of e-business development within the near future.	3
	adopts e-business applications based on business needs and plans.	4
	executes e-business activities according to an embedded plan.	5
Q8: What are the primary methods to communicate between all staff?	does not use any electronic method to communicate between staff.	1
	Mainly uses email to communicate between staff.	2
	promotes mobile working by using various integrated electronic devices.	3
	has an Intranet system for internal communication.	4
	has an Extranet system for permitted staff sharing/dealing information.	5

## Part 2: Benchmarking and Priority Analysis

INSTRUCTIONS: Figure 1 demonstrates the highest level of e-business integration in the eight critical factor areas. Please complete the analysis by the following steps:

- Step 1: according to your self-assessment in the part 1, please identify your current level of each critical factor the on the 5 points scale provided in Figure 1 and draw them together into a spider diagram.
- Step 2: identify the level you wish to achieve in each factor on the same 5 points scale provided in Figure 1 and draw a separate spider diagram.
- Step 3: identify the 'gap score' (the level you wish to achieve subtract achieved level) from Figure 2 and mark them in table 1.
- Step 4: rank the factors based on the importance of your business needs.
- Step 5: calculating the 'priority score' ('rank score' times 'gap score', the order of 'priority score' indicates the order of your priority for future e-business development).

Factors/Levels	Gap Score	Priority Score
Rank Score: please rank the following factors from '8' very important to '1' not important based on your business needs		
<b>Factor 1:</b> ICT Knowledge & Skills		
<b>Factor 2:</b> ICT Infrastructure		
<b>Factor 3:</b> Web-Marketing		
<b>Factor 4:</b> Website		
<b>Factor 5:</b> Resource Management		
<b>Factor 6:</b> Customer Management		
<b>Factor 7:</b> e-Vision & Strategy		
<b>Factor 8:</b> Internal Communication		

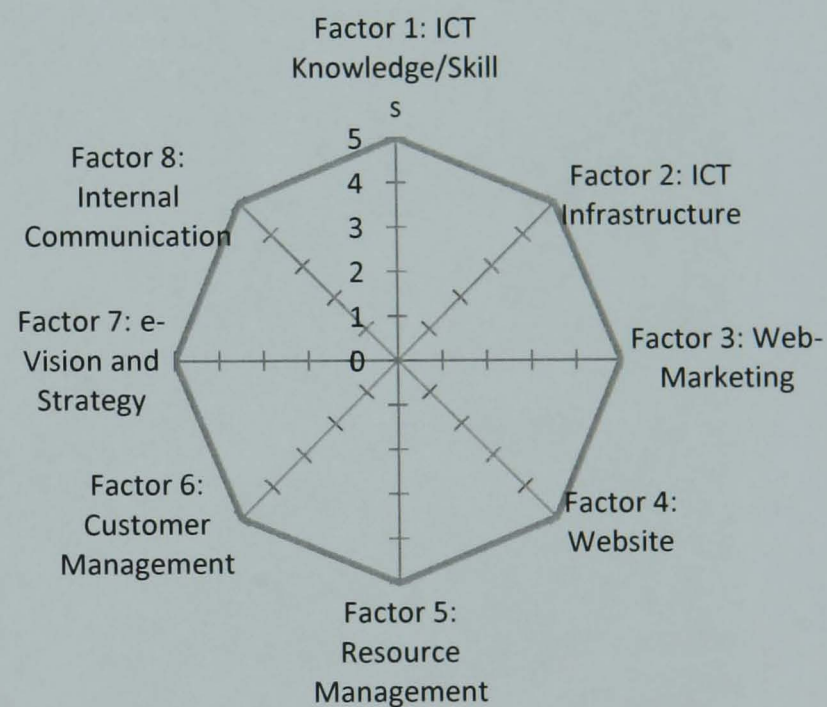


Figure 1: Benchmarking Analysis

Table 1: Priority Analysis

Benchmarking Analysis helps to identify the strengths and weaknesses of your current e-business performance. Your current and future ideal performances are benchmarked against full integration. Benchmarking also visibly demonstrates the gaps between your goals and your current situation. Priority Analysis helps to identify critical factors which require improvement and are ranked in the order of importance and necessity to your future e-b/c development, based on the needs of your business.

## Appendix 7.2 E-b/c assessment results: China Link

### SME E-Business/E-Commerce Self-assessment Tool

The aim of this self-assessment tool is to:

- assess your current e-business/e-commerce performance
- identify weaknesses and strengths against e-b/c integration levels
- identify goals and priorities for e-business/e-commerce adoption or development

#### Part 1: E-business/e-commerce Self-assessment

INSTRUCTIONS: Listed below are 8 questions which are designed to identify eight different areas of your e-business/e-commerce performance. Please select one answer **ONLY** to each question which is most appropriate to your firm's status.

Questions 1-8:	Answers: My company...	(Level)
Q1: Which answer best describes the level of ICT knowledge/skills in your company?	does not possess any relevant ICT knowledge/skills.	1
	has limited ICT knowledge/skills and e-business/e-commerce awareness.	2
	has some ICT knowledge/skills but call for support on an ad-hoc basis.	3
	has contracted external support who deal with ICT issues.	4
	is ICT knowledge/skills intensive and we have in-house ICT expertise.	5
Q2: Which statement best describes the level of ICT infrastructure in your company?	has stand-alone PCs and no internet connection.	1
	has basic PC connectivity typified by file sharing.	2
	has its own internal network server e.g. Local Area Network.	3
	has stand-alone e-business applications support online business activity.	4
	has an integrated systems supports all business activities electronically.	5
Q3: Which answer best describes marketing activities and the level of web-marketing in your company?	does not participate in marketing activities of any kind.	1
	promotes business mainly through tv, radio, newspaper, exhibitions etc.	2
	mainly involved in email promotions and email campaigns.	3
	displays and promotes business information through its own website.	4
	runs a range of online marketing campaigns e.g. search engine promotion, banner exchange, online-discussion & virtual communities.	5
Q4: Which statement best describes your company's website function?	does not possess a company website.	1
	publishes up-to-date business information on its website.	2
	accepts customers' orders or modification of existing orders online.	3
	facilitates customers' purchase online including payment transactions.	4
	website links suppliers' or internal operational systems automatically.	5
Q5: Which answer best describes your company's resource management systems?	does not regularly review demand and resource balance electronically.	1
	manages resources manually.	2
	uses stand-alone systems to manage resources.	3
	uses simple integrated e-technology or software to manage resources.	4
	a system links/shares all resource information with all parties involved.	5
Q6: What are the primary methods to contact and respond your customers enquires?	responds to customers mainly by letter/mail.	1
	responds to customers mainly by letter/mail and phone/fax in office hours.	2
	responds to customers mainly by email within and out of office hours.	3
	responds to customers mainly by its own website at anytime.	4
	answers customers' enquires in real time via e-business systems	5
Q7: Which statement best describes your e-vision and strategy to e-business?	has no strategic intentions, awareness or plans of e-business.	1
	is willing to explore the benefits of e-business but without goals and plans	2
	has an intended plan of e-business development within the near future.	3
	adopts e-business applications based on business needs and plans.	4
	executes e-business activities according to an embedded plan.	5
Q8: What are the primary methods to communicate between all staff?	does not use any electronic method to communicate between staff.	1
	Mainly uses email to communicate between staff.	2
	promotes mobile working by using various integrated electronic devices.	3
	has an Intranet system for internal communication.	4
	has an Extranet system for permitted staff sharing/dealing information.	5

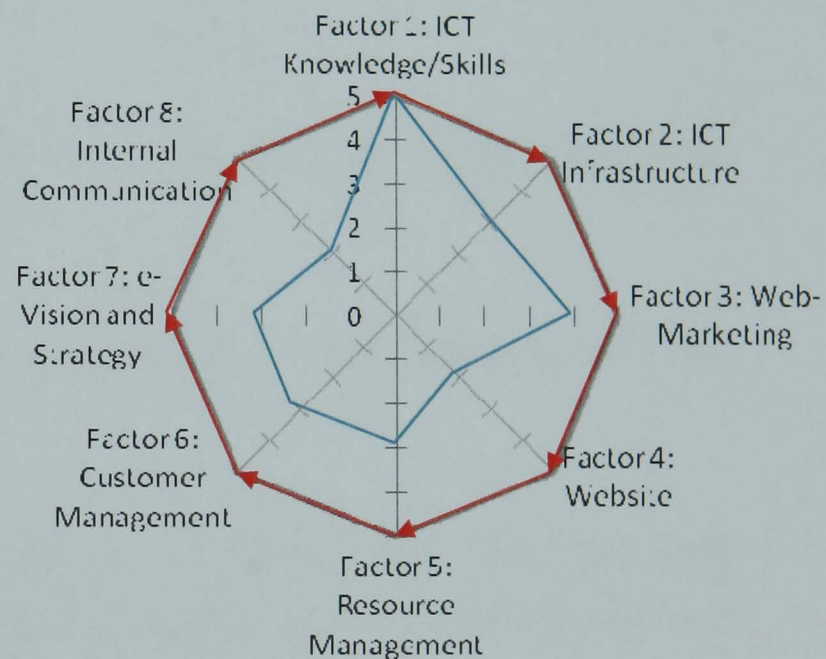
**Part 2: Benchmarking and Priority Analysis**

INSTRUCTIONS: Figure 1 demonstrates the highest level of e-business integration in the eight critical factor areas. Please complete the analysis by the following steps:

- Step 1: according to your self-assessment in the part 1, please identify your current level of each critical factor the on the 5 points scale provided in Figure 1 and draw them together into a spider diagram.
- Step 2: identify the level you wish to achieve in each factor on the same 5 points scale provided in Figure 1 and draw a separate spider diagram.
- Step 3: identify the 'gap score' (the level you wish to achieve subtract achieved level) from Figure 2 and mark them in table 1.
- Step 4: rank the factors based on the importance of your business needs.
- Step 5: calculating the 'priority score' ('rank score' times 'gap score', the order of 'priority score' indicates the order of your priority for future e-business development).

Factors/Levels		Gap Score	Priority Score
Rank Score: please rank the following factors from '8' very important to '1' not important based on your business needs			
<b>Factor 1:</b> ICT Knowledge & Skills	8	0	0
<b>Factor 2:</b> ICT Infrastructure	1	2	2
<b>Factor 3:</b> Web-Marketing	3	3	9
<b>Factor 4:</b> Website	4	3	12
<b>Factor 5:</b> Resource Management	7	2	14
<b>Factor 6:</b> Customer Management	2	2	4
<b>Factor 7:</b> e-Vision & Strategy	5	2	10
<b>Factor 8:</b> Internal Communication	6	3	18

**Table 1: Priority Analysis**



**Figure 1: Benchmarking Analysis** (the highest level 5 in each critical factor present the integration of the e-b/c system; the inner shape in blue represents the firm's current e-b/c performance, the red circle with arrows represents the desired future development)

Benchmarking Analysis helps to identify the strengths and weaknesses of your current e-business performance. Your current and future ideal performances are benchmarked against full integration. Benchmarking also visibly demonstrates the gaps between your goals and your current situation. Priority Analysis helps to identify critical factors which

require improvement and are ranked in the order of importance and necessity to your future e-b/c development, based on the needs of your business. You may go back to Part 1 for another audit after the implementation of your e-business performance at anytime.

**Brief Feedback:**

1. Is this tool easy to understand and to use? “Yes. Very straight forward.”
2. Does this tool help to assess your current e-business performance and to identify the strengths and weaknesses? “Yes, it is in line with the management’s valuation.”
3. Does this tool help you to identify future goals and priorities for e-business development? “It reconfirms the priority.”
4. Does this tool indicate how you could improve on your current performance? “No. It addresses what but not how.”
5. Do you feel more confident in developing your e-business after using this tool? “Yes. It reinforce the management views on areas required improvement and order of priorities.”
6. What changes or improvements can be made to this tool with regards to making it more practical and relevant to your business needs? “Refining the self-assessment criteria.”

## Appendix 7.3 E-b/c assessment results: United Automation

### SME E-Business/E-Commerce Self-assessment Tool

The aim of this self-assessment tool is to:

- assess your current e-business/e-commerce performance
- identify weaknesses and strengths against e-b/c integration levels
- identify goals and priorities for e-business/e-commerce adoption or development

#### Part 1: E-business/e-commerce Self-assessment

INSTRUCTIONS: Listed below are 8 questions which are designed to identify eight different areas of your e-business/e-commerce performance. Please select one answer **ONLY** to each question which is most appropriate to your firm's status.

Questions 1-8:	Answers: My company...	(Level)
Q1: Which answer best describes the level of ICT knowledge/skills in your company?	does not possess any relevant ICT knowledge/skills.	1
	has limited ICT knowledge/skills and e-business/e-commerce awareness.	2
	has some ICT knowledge/skills but call for support on an ad-hoc basis.	3
	has contracted external support who deal with ICT issues.	4
	is ICT knowledge/skills intensive and we have in-house ICT expertise.	5
Q2: Which statement best describes the level of ICT infrastructure in your company?	has stand-alone PCs and no internet connection.	1
	has basic PC connectivity typified by file sharing.	2
	has its own internal network server e.g. Local Area Network.	3
	has stand-alone e-business applications support online business activity.	4
	has an integrated systems supports all business activities electronically.	5
Q3: Which answer best describes marketing activities and the level of web-marketing in your company?	does not participate in marketing activities of any kind.	1
	promotes business mainly through tv, radio, newspaper, exhibitions etc.	2
	mainly involved in email promotions and email campaigns.	3
	displays and promotes business information through its own website.	4
	runs a range of online marketing campaigns e.g. search engine promotion, banner exchange, online-discussion & virtual communities.	5
Q4: Which statement best describes your company's website function?	does not possess a company website.	1
	publishes up-to-date business information on its website.	2
	accepts customers' orders or modification of existing orders online.	3
	facilitates customers' purchase online including payment transactions.	4
	website links suppliers' or internal operational systems automatically.	5
Q5: Which answer best describes your company's resource management systems?	does not regularly review demand and resource balance electronically.	1
	manages resources manually.	2
	uses stand-alone systems to manage resources.	3
	uses simple integrated e-technology or software to manage resources.	4
	a system links/shares all resource information with all parties involved.	5
Q6: What are the primary methods to contact and respond your customers enquires?	responds to customers mainly by letter/mail.	1
	responds to customers mainly by letter/mail and phone/fax in office hours.	2
	responds to customers mainly by email within and out of office hours.	3
	responds to customers mainly by its own website at anytime.	4
	answers customers' enquires in real time via e-business systems	5
Q7: Which statement best describes your e-vision and strategy to e-business?	has no strategic intentions, awareness or plans of e-business.	1
	is willing to explore the benefits of e-business but without goals and plans	2
	has an intended plan of e-business development within the near future.	3
	adopts e-business applications based on business needs and plans.	4
	executes e-business activities according to an embedded plan.	5
Q8: What are the primary methods to communicate between all staff?	does not use any electronic method to communicate between staff.	1
	Mainly uses email to communicate between staff.	2
	promotes mobile working by using various integrated electronic devices.	3
	has an Intranet system for internal communication.	4
	has an Extranet system for permitted staff sharing/dealing information.	5

## Part 2: Benchmarking and Priority Analysis

**INSTRUCTIONS:** Figure 1 demonstrates the highest level of e-business integration in the eight critical factor areas. Please complete the analysis by the following steps:

Step 1: according to your self-assessment in the part 1, please identify your current level of each critical factor the on the 5 points scale provided in Figure 1 and draw them together into a spider diagram.

Step 2: identify the level you wish to achieve in each factor on the same 5 points scale provided in Figure 1 and draw a separate spider diagram.

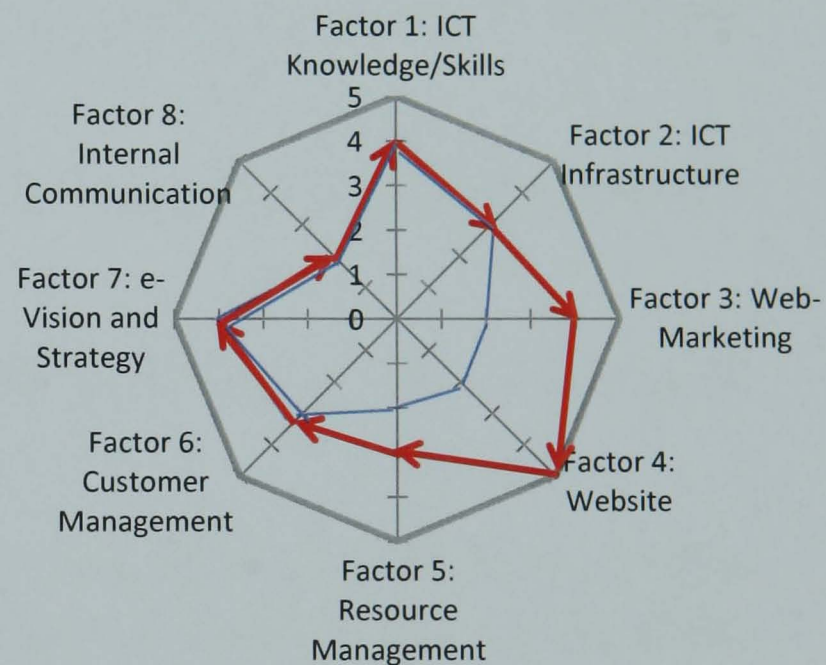
Step 3: identify the 'gap score' (the level you wish to achieve subtract achieved level) from Figure 2 and mark them in table 1.

Step 4: rank the factors based on the importance of your business needs.

Step 5: calculating the 'priority score' ('rank score' times 'gap score', the order of 'priority score' indicates the order of your priority for future e-business development).

Factors/Levels		Gap Score	Priority Score
Rank Score: please rank the following factors from '8' very important to '1' not important based on your business needs			
<b>Factor 1:</b> ICT Knowledge & Skills	8	1	8
<b>Factor 2:</b> ICT Infrastructure	8	2	16
<b>Factor 3:</b> Web-Marketing	7	3	21
<b>Factor 4:</b> Website	5	3	15
<b>Factor 5:</b> Resource Management	8	2	16
<b>Factor 6:</b> Customer Management	3	2	6
<b>Factor 7:</b> e-Vision & Strategy	7	1	7
<b>Factor 8:</b> Internal Communication	3	3	9

**Table 1:** Priority Analysis



**Figure 1:** Benchmarking Analysis (the highest level 5 in each critical factor present the integration of the e-b/c system; the inner shape in blue represents the firm's current e-b/c performance, the red circle with arrows represents the desired future development)

Benchmarking Analysis helps to identify the strengths and weaknesses of your current e-business performance. Your current and future ideal performances are benchmarked against full integration. Benchmarking also visibly demonstrates the gaps between your goals and your current situation. Priority Analysis helps to identify critical factors which require improvement and are ranked in the order of importance and necessity to your

future e-b/c development, based on the needs of your business. You may go back to Part 1 for another audit after the implementation of your e-business performance at anytime.

**Brief Feedback:**

1. Is this tool easy to understand and to use? “Yes, very easy to use.”
2. Does this tool help to assess your current e-business performance and to identify the strengths and weaknesses? “Yes.”
3. Does this tool help you to identify future goals and priorities for e-business development? “Yes.”
4. Does this tool indicate how you could improve on your current performance? “Yes.”
5. Do you feel more confident in developing your e-business after using this tool? “Yes.”
6. What changes or improvements can be made to this tool with regards to making it more practical and relevant to your business needs? “Convert it to a software tool.”



## Appendix 7.4 E-b/c assessment results: Stonesand

### SME E-Business/E-Commerce Self-assessment Tool

The aim of this self-assessment tool is to:

- assess your current e-business/e-commerce performance
- identify weaknesses and strengths against e-b/c integration levels
- identify goals and priorities for e-business/e-commerce adoption or development

#### Part 1: E-business/e-commerce Self-assessment

**INSTRUCTIONS:** Listed below are 8 questions which are designed to identify eight different areas of your e-business/e-commerce performance. Please select one answer **ONLY** to each question which is most appropriate to your firm's status.

Questions 1-8:	Answers: My company...	(Level)
Q1: Which answer best describes the level of ICT knowledge/skills in your company?	does not possess any relevant ICT knowledge/skills.	1
	has limited ICT knowledge/skills and e-business/e-commerce awareness.	2
	has some ICT knowledge/skills but call for support on an ad-hoc basis.	3,3
	has contracted external support who deal with ICT issues.	4
	is ICT knowledge/skills intensive and we have in-house ICT expertise.	5
Q2: Which statement best describes the level of ICT infrastructure in your company?	has stand-alone PCs and no internet connection.	1
	has basic PC connectivity typified by file sharing.	2
	has its own internal network server e.g. Local Area Network.	3
	has stand-alone e-business applications support online business activity.	4
	has an integrated systems supports all business activities electronically.	5
Q3: Which answer best describes marketing activities and the level of web-marketing in your company?	does not participate in marketing activities of any kind.	1
	promotes business mainly through tv, radio, newspaper, exhibitions etc.	2
	mainly involved in email promotions and email campaigns.	3
	displays and promotes business information through its own website.	4,4
	runs a range of online marketing campaigns e.g. search engine promotion, banner exchange, online-discussion & virtual communities.	5
Q4: Which statement best describes your company's website function?	does not possess a company website.	1
	publishes up-to-date business information on its website.	2
	accepts customers' orders or modification of existing orders online.	3
	facilitates customers' purchase online including payment transactions.	4
	website links suppliers' or internal operational systems automatically.	5
Q5: Which answer best describes your company's resource management systems?	does not regularly review demand and resource balance electronically.	1
	manages resources manually.	2
	uses stand-alone systems to manage resources.	3
	uses simple integrated e-technology or software to manage resources.	4
	a system links/shares all resource information with all parties involved.	5
Q6: What are the primary methods to contact and respond your customers enquires?	responds to customers mainly by letter/mail.	1
	responds to customers mainly by letter/mail and phone/fax in office hours.	2,2
	responds to customers mainly by email within and out of office hours.	3
	responds to customers mainly by its own website at anytime.	4
	answers customers' enquires in real time via e-business systems	5
Q7: Which statement best describes your e-vision and strategy to e-business?	has no strategic intentions, awareness or plans of e-business.	1
	is willing to explore the benefits of e-business but without goals and plans	2
	has an intended plan of e-business development within the near future.	3
	adopts e-business applications based on business needs and plans.	4
	executes e-business activities according to an embedded plan.	5
Q8: What are the primary methods to communicate between all staff?	does not use any electronic method to communicate between staff.	1
	Mainly uses email to communicate between staff.	2
	promotes mobile working by using various integrated electronic devices.	3
	has an Intranet system for internal communication.	4
	has an Extranet system for permitted staff sharing/dealing information.	5

## Part 2: Benchmarking and Priority Analysis

**INSTRUCTIONS:** Figure 1 demonstrates the highest level of e-business integration in the eight critical factor areas. Please complete the analysis by the following steps:

Step 1: according to your self-assessment in the part 1, please identify your current level of each critical factor the on the 5 points scale provided in Figure 1 and draw them together into a spider diagram.

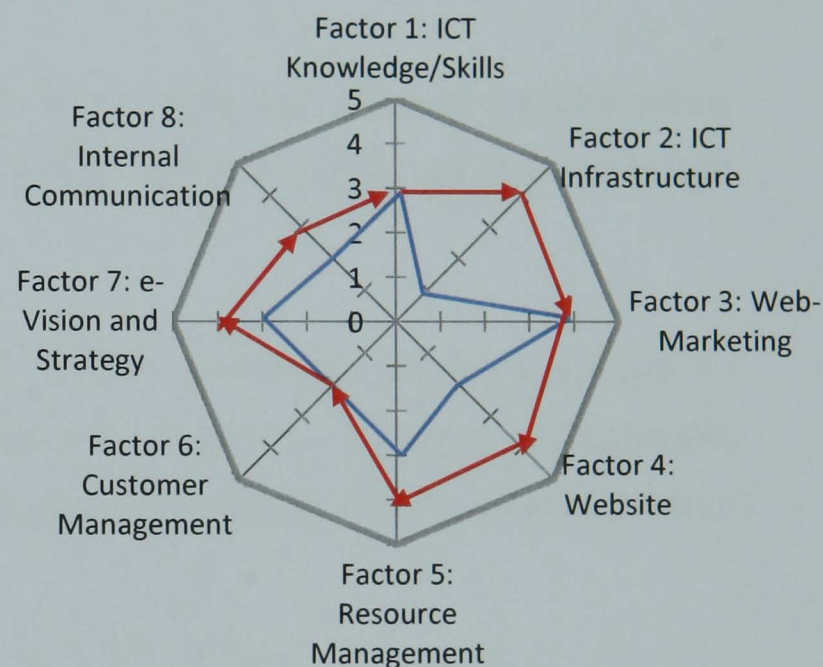
Step 2: identify the level you wish to achieve in each factor on the same 5 points scale provided in Figure 1 and draw a separate spider diagram.

Step 3: identify the 'gap score' (the level you wish to achieve subtract achieved level) from Figure 2 and mark them in table 1.

Step 4: rank the factors based on the importance of your business needs.

Step 5: calculating the 'priority score' ('rank score' times 'gap score', the order of 'priority score' indicates the order of your priority for future e-business development).

Factors/Levels		Gap Score	Priority Score
Rank Score: please rank the following factors from '8' very important to '1' not important based on your business needs			
<b>Factor 1:</b> ICT Knowledge & Skills	4	0	0
<b>Factor 2:</b> ICT Infrastructure	3	3	9
<b>Factor 3:</b> Web-Marketing	1	0	0
<b>Factor 4:</b> Website	5	2	10
<b>Factor 5:</b> Resource Management	8	1	8
<b>Factor 6:</b> Customer Management	6	0	0
<b>Factor 7:</b> e-Vision & Strategy	2	1	2
<b>Factor 8:</b> Internal Communication	7	0	0



**Figure 1: Benchmarking Analysis** (the highest level 5 in each critical factor present the integration of the e-b/c system; the inner shape in blue represents the firm's current e-b/c performance, the red circle with arrows represents the desired future development)

**Table 1: Priority Analysis**

Benchmarking Analysis helps to identify the strengths and weaknesses of your current e-business performance. Your current and future ideal performances are benchmarked against full integration. Benchmarking also visibly demonstrates the gaps between your goals and your current situation. Priority Analysis helps to identify critical factors which require improvement and are ranked in the order of importance and necessity to your

future e-b/c development, based on the needs of your business. You may go back to Part 1 for another audit after the implementation of your e-business performance at anytime.

**NOTE:**

I have highlighted current “scores in red, desired realistic future state score in yellow. I cannot complete the spider diagram electronically, which for speed of response is probably what you would prefer. You will have draw he diagrams yourself from my responses.

**Brief Feedback:**

- Is this tool easy to understand and to use? “Not clear whether the importance factors have to use all numbers between 1 and 8 or if each business area can be anything between 1 and 8.”
- Does this tool help to assess your current e-business performance and to identify the strengths and weaknesses? “It helps to crystallize improvement requirements which are known intuitively but formalizing them in some form of priority is useful.”
- Does this tool help you to identify future goals and priorities for e-business development? “Yes.”
- Does this tool indicate how you could improve on your current performance? “Yes.”
- Do you feel more confident in developing your e-business after using this tool? “Yes.”
- What changes or improvements can be made to this tool with regards to making it more practical and relevant to your business needs? N/A

## **Appendix 7.5 Interview questions**

### **Background of the company:**

(business, sector, turnover, employees number and etc.)

### **Interview Questions:**

1. Is this tool easy to understand and to use?
  
2. Does this tool help to assess your current e-business performance in order to identify the strengths and weaknesses?
  
3. Do you feel more confident in developing your e-business after using this tool?
  
4. Have you ever had an assessment or evaluation of your e-business performance before (either from a professional body or from your senior management team)?

#### **If the answer is yes:**

5. Is the result the same or similar as your previous evaluation?

#### **If the answer is no:**

6. Does the result give you more e-business awareness and a clear direction for future development?

## Appendix 7.6 E-b/c assessment results: Try and Lilly Ltd.

### SME E-Business/E-Commerce Self-assessment Tool

The aim of this self-assessment tool is to:

- assess your current e-business/e-commerce performance
- identify weaknesses and strengths against e-b/c integration levels
- identify goals and priorities for e-business/e-commerce adoption or development

#### Part 1: E-business/e-commerce Self-assessment

**INSTRUCTIONS:** Listed below are 8 questions which are designed to identify eight different areas of your e-business/e-commerce performance. Please select one answer **ONLY** to each question which is most appropriate to your firm's status.

Questions 1-8:	Answers: My company...	(Level)
Q1: Which answer best describes the level of ICT knowledge/skills in your company?	does not possess any relevant ICT knowledge/skills.	1
	has limited ICT knowledge/skills and e-business/e-commerce awareness.	2
	has some ICT knowledge/skills but call for support on an ad-hoc basis.	3
	has contracted external support who deal with ICT issues.	4
	is ICT knowledge/skills intensive and we have in-house ICT expertise.	5
Q2: Which statement best describes the level of ICT infrastructure in your company?	has stand-alone PCs and no internet connection.	1
	has basic PC connectivity typified by file sharing.	2
	has its own internal network server e.g. Local Area Network.	3
	has stand-alone e-business applications support online business activity.	4
	has an integrated systems supports all business activities electronically.	5
Q3: Which answer best describes marketing activities and the level of web-marketing in your company?	does not participate in marketing activities of any kind.	1
	promotes business mainly through tv, radio, newspaper, exhibitions etc.	2
	mainly involved in email promotions and email campaigns.	3
	displays and promotes business information through its own website.	4
	runs a range of online marketing campaigns e.g. search engine promotion, banner exchange, online-discussion & virtual communities.	5
Q4: Which statement best describes your company's website function?	does not possess a company website.	1
	publishes up-to-date business information on its website.	2
	accepts customers' orders or modification of existing orders online.	3
	facilitates customers' purchase online including payment transactions.	4
	website links suppliers' or internal operational systems automatically.	5
Q5: Which answer best describes your company's resource management systems?	does not regularly review demand and resource balance electronically.	1
	manages resources manually.	2
	uses stand-alone systems to manage resources.	3
	uses simple integrated e-technology or software to manage resources.	4
	a system links/shares all resource information with all parties involved.	5
Q6: What are the primary methods to contact and respond your customers enquires?	responds to customers mainly by letter/mail.	1
	responds to customers mainly by letter/mail and phone/fax in office hours.	2
	responds to customers mainly by email within and out of office hours.	3
	responds to customers mainly by its own website at anytime.	4
	answers customers' enquires in real time via e-business systems	5
Q7: Which statement best describes your e-vision and strategy to e-business?	has no strategic intentions, awareness or plans of e-business.	1
	is willing to explore the benefits of e-business but without goals and plans	2
	has an intended plan of e-business development within the near future.	3
	adopts e-business applications based on business needs and plans.	4
	executes e-business activities according to an embedded plan.	5
Q8: What are the primary methods to communicate between all staff?	does not use any electronic method to communicate between staff.	1
	Mainly uses email to communicate between staff.	2
	promotes mobile working by using various integrated electronic devices.	3
	has an Intranet system for internal communication.	4
	has an Extranet system for permitted staff sharing/dealing information.	5

## Part 2: Benchmarking and Priority Analysis

INSTRUCTIONS: Figure 1 demonstrates the highest level of e-business integration in the eight critical factor areas. Please complete the analysis by the following steps:

Step 1: according to your self-assessment in the part 1, please identify your current level of each critical factor the on the 5 points scale provided in Figure 1 and draw them together into a spider diagram.

Step 2: identify the level you wish to achieve in each factor on the same 5 points scale provided in Figure 1 and draw a separate spider diagram.

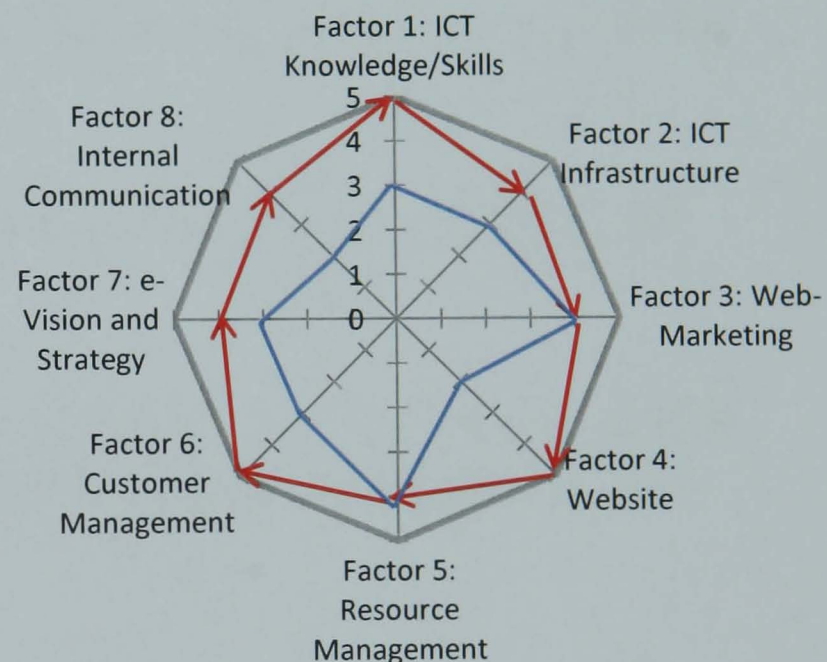
Step 3: identify the 'gap score' (the level you wish to achieve subtract achieved level) from Figure 2 and mark them in table 1.

Step 4: rank the factors based on the importance of your business needs.

Step 5: calculating the 'priority score' ('rank score' times 'gap score', the order of 'priority score' indicates the order of your priority for future e-business development).

Factors/Levels		Gap Score	Priority Score
Rank Score: please rank the following factors from '5' very important to '1' not important based on your business needs			
<b>Factor 1:</b> ICT Knowledge & Skills	2	3	4
<b>Factor 2:</b> ICT Infrastructure	2	1	2
<b>Factor 3:</b> Web-Marketing	3	0	0
<b>Factor 4:</b> Website	4	3	12
<b>Factor 5:</b> Resource Management	2	0	0
<b>Factor 6:</b> Customer Management	4	2	8
<b>Factor 7:</b> e-Vision & Strategy	3	1	3
<b>Factor 8:</b> Internal Communication	3	2	6

**Table 1:** Priority Analysis



**Figure 1:** Benchmarking Analysis (the highest level 5 in each critical factor present the integration of the e-b/c system; the inner shape in blue represents the firm's current e-b/c performance, the red circle with arrows represents the desired future development)

Benchmarking Analysis helps to identify the strengths and weaknesses of your current e-business performance. Your current and future ideal performances are benchmarked against full integration. Benchmarking also visibly demonstrates the gaps between your goals and your current situation. Priority Analysis helps to identify critical factors which require improvement and are ranked in the order of importance and necessity to your

future e-b/c development, based on the needs of your business. You may go back to Part 1 for another audit after the implementation of your e-business performance at anytime.

**Interview Questions:**

1. Is this tool easy to understand and to use?

“Yes, this tool is very easy to understand and to use.”

2. Does this tool help to assess your current e-business performance in order to identify the strengths and weaknesses?

“Yes, it helped us to identify the strengths and weaknesses through the assessment.”

3. Do you feel more confident in developing your e-business after using this tool?

“Yes, of course.”

4. Have you ever had an assessment or evaluation of your e-business performance before (either from a professional body or from your senior management team)?

“No, never had one but would love to.”

**If the answer is yes:**

5. Is the result the same or similar as your previous evaluation?

**If the answer is no:**

6. Does the result give you more e-business awareness and a clear direction for future development?

“Yes, it does. We are extremely keen on improving our e-business performance. We wanted to change our systems two years ago but lacked a clear vision of what was exactly required and subsequently proved difficult to influence all managers and staff to share my vision on change without any evidence or strategic plan. There was no easy to apply e-business tool for SMEs and I have

no intention of answering pages and pages of questions (no more than two pages of questions). By undertaking the self assessment, it has helped me to obtain a clearer picture for future development. I believe the tool can also help me to share the e-b/c vision with my staff more effectively across different departments. I will implement a action plan based on the assessment results.”



## Appendix 7.7 E-b/c assessment results: Mersey Maritime Ltd.

### SME E-Business/E-Commerce Self-assessment Tool

The aim of this self-assessment tool is to:

- assess your current e-business/e-commerce performance
- identify weaknesses and strengths against e-b/c integration levels
- identify goals and priorities for e-business/e-commerce adoption or development

#### Part 1: E-business/e-commerce Self-assessment

INSTRUCTIONS: Listed below are 8 questions which are designed to identify eight different areas of your e-business/e-commerce performance. Please select one answer **ONLY** to each question which is most appropriate to your firm's status.

Questions 1-8:	Answers: My company...	(Level)
Q1: Which answer best describes the level of ICT knowledge/skills in your company?	does not possess any relevant ICT knowledge/skills.	1
	has limited ICT knowledge/skills and e-business/e-commerce awareness.	2
	has some ICT knowledge/skills but call for support on an ad-hoc basis.	3
	has contracted external support who deal with ICT issues.	4
	is ICT knowledge/skills intensive and we have in-house ICT expertise.	5
Q2: Which statement best describes the level of ICT infrastructure in your company?	has stand-alone PCs and no internet connection.	1
	has basic PC connectivity typified by file sharing.	2
	has its own internal network server e.g. Local Area Network.	3
	has stand-alone e-business applications support online business activity.	4
	has an integrated systems supports all business activities electronically.	5
Q3: Which answer best describes marketing activities and the level of web-marketing in your company?	does not participate in marketing activities of any kind.	1
	promotes business mainly through tv, radio, newspaper, exhibitions etc.	2
	mainly involved in email promotions and email campaigns.	3
	displays and promotes business information through its own website.	4
	runs a range of online marketing campaigns e.g. search engine promotion, banner exchange, online-discussion & virtual communities.	5
Q4: Which statement best describes your company's website function?	does not possess a company website.	1
	publishes up-to-date business information on its website.	2
	accepts customers' orders or modification of existing orders online.	3
	facilitates customers' purchase online including payment transactions.	4
	website links suppliers' or internal operational systems automatically.	5
Q5: Which answer best describes your company's resource management systems?	does not regularly review demand and resource balance electronically.	1
	manages resources manually.	2
	uses stand-alone systems to manage resources.	3
	uses simple integrated e-technology or software to manage resources.	4
	a system links/shares all resource information with all parties involved.	5
Q6: What are the primary methods to contact and respond your customers enquires?	responds to customers mainly by letter/mail.	1
	responds to customers mainly by letter/mail and phone/fax in office hours.	2
	responds to customers mainly by email within and out of office hours.	3
	responds to customers mainly by its own website at anytime.	4
	answers customers' enquires in real time via e-business systems	5
Q7: Which statement best describes your e-vision and strategy to e-business?	has no strategic intentions, awareness or plans of e-business.	1
	is willing to explore the benefits of e-business but without goals and plans	2
	has an intended plan of e-business development within the near future.	3
	adopts e-business applications based on business needs and plans.	4
	executes e-business activities according to an embedded plan.	5
Q8: What are the primary methods to communicate between all staff?	does not use any electronic method to communicate between staff.	1
	Mainly uses email to communicate between staff.	2
	promotes mobile working by using various integrated electronic devices.	3
	has an Intranet system for internal communication.	4
	has an Extranet system for permitted staff sharing/dealing information.	5

## Part 2: Benchmarking and Priority Analysis

INSTRUCTIONS: Figure 1 demonstrates the highest level of e-business integration in the eight critical factor areas. Please complete the analysis by the following steps:

Step 1: according to your self-assessment in the part 1, please identify your current level of each critical factor the on the 5 points scale provided in Figure 1 and draw them together into a spider diagram.

Step 2: identify the level you wish to achieve in each factor on the same 5 points scale provided in Figure 1 and draw a separate spider diagram.

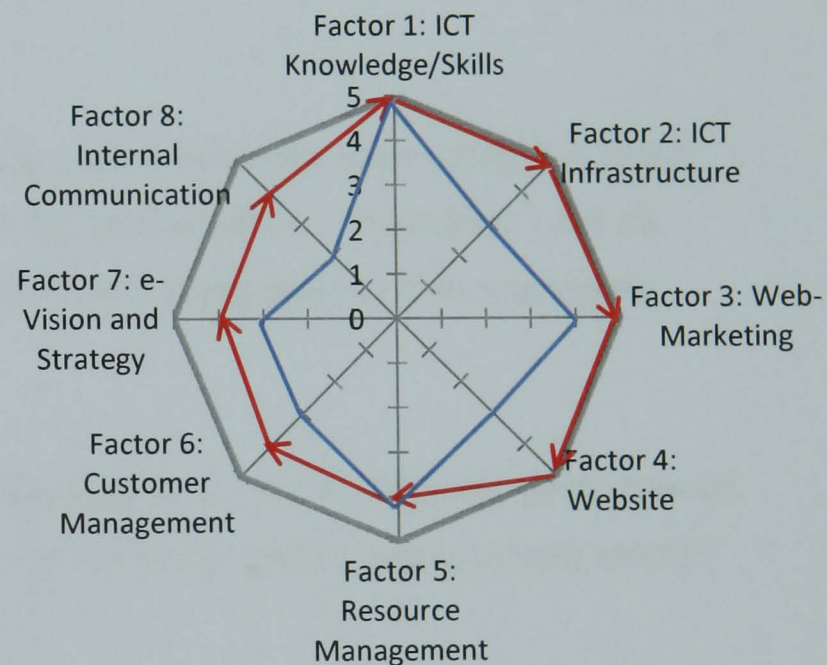
Step 3: identify the 'gap score' (the level you wish to achieve subtract achieved level) from Figure 2 and mark them in table 1.

Step 4: rank the factors based on the importance of your business needs.

Step 5: calculating the 'priority score' ('rank score' times 'gap score', the order of 'priority score' indicates the order of your priority for future e-business development).

Factors/Levels		Gap Score	Priority Score
Rank Score: please rank the following factors from '5' very important to '1' not important based on your business needs			
<b>Factor 1:</b> ICT Knowledge & Skills	1	0	0
<b>Factor 2:</b> ICT Infrastructure	4	2	8
<b>Factor 3:</b> Web-Marketing	2	1	2
<b>Factor 4:</b> Website	3	2	6
<b>Factor 5:</b> Resource Management	4	0	0
<b>Factor 6:</b> Customer Management	5	1	5
<b>Factor 7:</b> e-Vision & Strategy	5	1	5
<b>Factor 8:</b> Internal Communication	3	2	6

**Table 1:** Priority Analysis



**Figure 1:** Benchmarking Analysis (the highest level 5 in each critical factor present the integration of the e-b/c system; the inner shape in blue represents the firm's current e-b/c performance, the red circle with arrows represents the desired future development)

Benchmarking Analysis helps to identify the strengths and weaknesses of your current e-business performance. Your current and future ideal performances are benchmarked against full integration. Benchmarking also visibly demonstrates the gaps between your goals and your current situation. Priority Analysis helps to identify critical factors which require improvement and are ranked in the order of importance and necessity to your

future e-b/c development, based on the needs of your business. You may go back to Part 1 for another audit after the implementation of your e-business performance at anytime.

**Interview Questions:**

1. Is this tool easy to understand and to use?

“Yes.”

2. Does this tool help to assess your current e-business performance in order to identify the strengths and weaknesses?

“Yes.”

3. Do you feel more confident in developing your e-business after using this tool?

“Yes, it provides a clear picture of our e-b/c performance. Therefore, I will be more confident to communicate the results and strategies to other managers across different departments.”

4. Have you ever had an assessment or evaluation of your e-business performance before (either from a professional body or from your senior management team)?

“Not for e-b/c assessment.”

**If the answer is yes:**

5. Is the result the same or similar as your previous evaluation?

**If the answer is no:**

6. Does the result give you more e-business awareness and a clear direction for future development?

“Yes, it does. I believe that the single, biggest problem faced by the company is its fragmented internal communication between staff. Each division has its own vision and strategy of e-business development. The different divisions need to unite together to make essential change for growth but nothing helped us to

share the same vision. Using an assessment tool like this is a breakthrough which I believe will help us finally to grow together as a team. In addition, we always believed that communication is the biggest problem but I just realised the ICT infrastructure is the root of the problem through the priority analysis. The ICT infrastructure is the main obstacle for preventing any progress or change. This assessment tool proved to be very effective and useful which I believe will enable our management team to plan a more effective strategy. I would like to repeat the assessment in different divisions in order to formulate a unified strategic approach to take the company forward.”

## Appendix 7.8 E-b/c assessment results: R Baker (Electrical) Ltd.

### SME E-Business/E-Commerce Self-assessment Tool

The aim of this self-assessment tool is to:

- assess your current e-business/e-commerce performance
- identify weaknesses and strengths against e-b/c integration levels
- identify goals and priorities for e-business/e-commerce adoption or development

#### Part 1: E-business/e-commerce Self-assessment

INSTRUCTIONS: Listed below are 8 questions which are designed to identify eight different areas of your e-business/e-commerce performance. Please select one answer **ONLY** to each question which is most appropriate to your firm's status.

Questions 1-8:	Answers: My company...	(Level)
Q1: Which answer best describes the level of ICT knowledge/skills in your company?	does not possess any relevant ICT knowledge/skills.	1
	has limited ICT knowledge/skills and e-business/e-commerce awareness.	2
	has some ICT knowledge/skills but call for support on an ad-hoc basis.	3
	has contracted external support who deal with ICT issues.	-4
	is ICT knowledge/skills intensive and we have in-house ICT expertise.	5
Q2: Which statement best describes the level of ICT infrastructure in your company?	has stand-alone PCs and no internet connection.	1
	has basic PC connectivity typified by file sharing.	2
	has its own internal network server e.g. Local Area Network.	3
	has stand-alone e-business applications support online business activity.	4
	has an integrated systems supports all business activities electronically.	-5
Q3: Which answer best describes marketing activities and the level of web-marketing in your company?	does not participate in marketing activities of any kind.	1
	promotes business mainly through tv, radio, newspaper, exhibitions etc.	2
	mainly involved in email promotions and email campaigns.	3
	displays and promotes business information through its own website.	-4
	runs a range of online marketing campaigns e.g. search engine promotion, banner exchange, online-discussion & virtual communities.	5
Q4: Which statement best describes your company's website function?	does not possess a company website.	1
	publishes up-to-date business information on its website.	2
	accepts customers' orders or modification of existing orders online.	3
	facilitates customers' purchase online including payment transactions.	4
	website links suppliers' or internal operational systems automatically.	5
Q5: Which answer best describes your company's resource management systems?	does not regularly review demand and resource balance electronically.	1
	manages resources manually.	2
	uses stand-alone systems to manage resources.	3
	uses simple integrated e-technology or software to manage resources.	4
	a system links/shares all resource information with all parties involved.	-5
Q6: What are the primary methods to contact and respond your customers enquires?	responds to customers mainly by letter/mail.	1
	responds to customers mainly by letter/mail and phone/fax in office hours.	2
	responds to customers mainly by email within and out of office hours.	3
	responds to customers mainly by its own website at anytime.	4
	answers customers' enquires in real time via e-business systems	-5
Q7: Which statement best describes your e-vision and strategy to e-business?	has no strategic intentions, awareness or plans of e-business.	1
	is willing to explore the benefits of e-business but without goals and plans	2
	has an intended plan of e-business development within the near future.	-3
	adopts e-business applications based on business needs and plans.	4
	executes e-business activities according to an embedded plan.	5
Q8: What are the primary methods to communicate between all staff?	does not use any electronic method to communicate between staff.	1
	Mainly uses email to communicate between staff.	2
	promotes mobile working by using various integrated electronic devices.	3
	has an Intranet system for internal communication.	4
	has an Extranet system for permitted staff sharing/dealing information.	-5

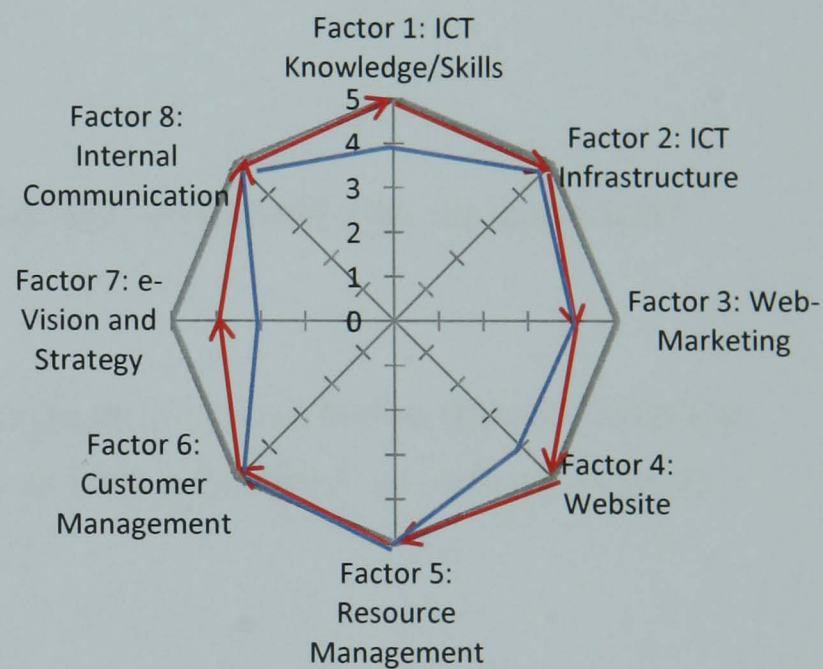
## Part 2: Benchmarking and Priority Analysis

INSTRUCTIONS: Figure 1 demonstrates the highest level of e-business integration in the eight critical factor areas. Please complete the analysis by the following steps:

- Step 1: according to your self-assessment in the part 1, please identify your current level of each critical factor the on the 5 points scale provided in Figure 1 and draw them together into a spider diagram.
- Step 2: identify the level you wish to achieve in each factor on the same 5 points scale provided in Figure 1 and draw a separate spider diagram.
- Step 3: identify the 'gap score' (the level you wish to achieve subtract achieved level) from Figure 2 and mark them in table 1.
- Step 4: rank the factors based on the importance of your business needs.
- Step 5: calculating the 'priority score' ('rank score' times 'gap score', the order of 'priority score' indicates the order of your priority for future e-business development).

Factors/Levels		Gap Score	Priority Score
Rank Score: please rank the following factors from '5' very important to '1' not important based on your business needs			
<b>Factor 1:</b> ICT Knowledge & Skills	4	1	4
<b>Factor 2:</b> ICT Infrastructure	4	0	0
<b>Factor 3:</b> Web-Marketing	3	0	0
<b>Factor 4:</b> Website	4	1	4
<b>Factor 5:</b> Resource Management	4	0	0
<b>Factor 6:</b> Customer Management	5	0	0
<b>Factor 7:</b> e-Vision & Strategy	3	1	3
<b>Factor 8:</b> Internal Communication	5	0	0

**Table 1:** Priority Analysis



**Figure 1:** Benchmarking Analysis (the highest level 5 in each critical factor present the integration of the e-b/c system; the inner shape in blue represents the firm's current e-b/c performance, the red circle with arrows represents the desired future development)

Benchmarking Analysis helps to identify the strengths and weaknesses of your current e-business performance. Your current and future ideal performances are benchmarked against full integration. Benchmarking also visibly demonstrates the gaps between your goals and your current situation. Priority Analysis helps to identify critical factors which require improvement and are ranked in the order of importance and necessity to your

future e-b/c development, based on the needs of your business. You may go back to Part 1 for another audit after the implementation of your e-business performance at anytime.

### **Interview Questions:**

1. Is this tool easy to understand and to use?

“Yes.”

2. Does this tool help to assess your current e-business performance in order to identify the strengths and weaknesses?

“Yes.”

3. Do you feel more confident in developing your e-business after using this tool?

“Yes.”

4. Have you ever had an assessment or evaluation of your e-business performance before (either from a professional body or from your senior management team)?

“Yes.”

### **If the answer is yes:**

5. Is the result the same or similar as your previous evaluation?

“I am very surprised that the results from the self-assessment are very similar compared with previous evaluation from a professional body. I am also delighted to know that the results confirm the overall strategy and direction of future development. Being a visionary leader myself, I never felt that identifying priorities is important than other daily tasks. The assessment has helped me to wake up from endless daily tasks but to concentrate on our e-b/c vision, strategies and the priorities for future development. Although we had a similar e-b/c evaluation few year before which helped us to understand our e-b/c performance and possible future development but it never helped us to identify the priorities. In addition, it was time consuming and costly and little has

improved since then. As a typical small business, we are doing better than others in terms of e-b/c performance. Although I am aware of the possible future development but I never had encourage changing anything as I did not know where to start. Small firms are different from large companies in numerous ways. A significant difference is that most small business owners/directors need to take care of almost everything within their business. There are always operational issues that require attention, rather than solely focusing on business strategy. I thought increasing sales is the only priority and dealing with millions operational issues is my responsibility and is the reality for all small business owners. I often undertake as many responsibilities as I can and have to juggle between numerous daily tasks. Therefore I never had time to derive a detailed e-business plan although I always knew where this company needs to be. In addition, I think it is extremely difficult to identify an e-business strategy with limited capacity, time and resource. Now I have just realised that identifying priorities for the e-b/c development is the key to success through the assessment. I believe this assessment tool will assist me to make clearer business decisions and communicate the decisions to my management team confidently. The only negative feedback on the assessment tool was that it did not provide the detail information required to progress onto the next level within each critical area.”

**If the answer is no:**

6. Does the result give you more e-business awareness and a clear direction for future development?



## **Glossary**

### **Bricks and Clicks**

Bricks and clicks is an internet business model by which a company integrates both offline (bricks) and online (clicks) presences. The model refers to the marriage of traditional ways to conduct a business (often using direct, face-to-face contacts with customers) and Internet ways to interact with customers (often via websites, email, FTP and other internet technologies).

### **CRM**

Customer relationship management is a broadly recognised, widely-implemented strategy for managing and nurturing a company's interactions with customers and sales prospects. It involves using technology to organise, automate, and synchronize business processes—principally sales related activities, but also those for marketing, customer service, and technical support. The overall goals are to find, attract, and win new customers, nurture and retain those the company already has, entice former customers back into the fold, and reduce the costs of marketing and customer service.

### **E-business best practice**

E-business best practice is a set of benchmarking practices recognised in the literature that other firms should follow.

### **E-b/c capabilities**

E-b/c capabilities are ICT related knowledge, skills and infrastructure which enable and facilitate a firm to adopt and develop e-business/e-commerce.

### **E-customer Management**

It is an online system that allows a firm to engage and track its customers online activities. It utilises advanced techniques of web analytics, email marketing, social networking and etc. for the maximum effectiveness of customer care, service and management.

### **e-Government/governance**

e-Government is the use of information and communication technologies (ICTs) to improve the activities of public sector organisations. Some definitions restrict e-government to Internet-enabled applications only, or only to interactions between government and outside groups. Here, we do not - all digital ICTs are included; all public sector activities are included.

### **Electronic interface**

It is an electronic device or system between the business and its customers.

### **e-Marketing**

e-Marketing or electronic marketing refers to the application of marketing principles and techniques via electronic media and more specifically the Internet. The terms e-Marketing, Internet marketing and online marketing, are frequently interchanged, and can often be considered synonymous. e-Marketing is the process of marketing a brand using the Internet. It includes both direct response marketing and indirect marketing elements and uses a range of technologies to help connect businesses to their customers. e-Marketing encompasses all the activities a business conducts via the worldwide web with the aim of attracting new business, retaining current business and developing its brand identity.

### **e-Procurement**

e-Procurement is the business to business (B2B) purchasing of goods and services through the Internet.

### **e-Resource Management**

Electronic resource management (ERM) is the practices and software systems used by firms to analyse, manage and keep track of purchasing information and its resources, especially internet-based resources.

### **ERP**

Enterprise resource planning (ERP) is a term usually used in conjunction with ERP software or an ERP system which is intended to manage all the information and functions of a business or company from shared data stores. It is a commercial software package that promotes seamless integration of all the information flowing through a company. An ERP system typically has modular hardware and software units and "services" that communicate on a local area network. The modular design allows a business to add or reconfigure modules (perhaps from different vendors) while preserving data integrity in one shared database that may be centralised or distributed.

### **Fixed factors**

A list of factors that used to identify a firm's characteristics. Those factors are likely to influence the success of e-business adoption and development but they are unlikely to be changed or improved within the short period of time.

### **ICT**

Information and communication technology (ICT) allows users to participate in a rapidly changing world in which work and other activities are increasingly transformed by access to varied and developing technologies. By this definition, you could almost say ICT is technology's

version of economic growth, to satisfy the needs and wants of the community over time. ICT tools can be used to find, explore, analyse, exchange and present information responsibly and without discrimination. ICT can be employed to give users quick access to ideas and experiences from a wide range of people, communities and cultures.

### **ICT ad-hoc**

Ad-hoc is a Latin phrase which means “for this purpose”. It generally signifies a solution designed for a specific problem or task, non-generalisable, and which can not be adapted to other purposes. ICT ad-hoc means a firm pays for the one-off service that can solve the ICT problems when it occurs in the company.

### **Large firms**

A firm employs more than 250 staff.

### **Medium firms**

A firm employs more than 50 staff but less than 250 staff.

### **Online-trading**

Online-trading means doing business online. A firm is able to sell its products/services to customers directly online or buying products/services from its suppliers or both. Online-trading engages a firm’s customers and suppliers together through electronic and automatic business process.

### **One-Way ANOVA**

In statistics, one-way analysis of variance (abbreviated one-way ANOVA) is a technique used to compare means of two or more samples (using the F distribution). This technique can be used only for numerical data. The ANOVA tests the null hypothesis that samples in two or more groups are drawn from the same population.

**Post Hoc test**

Post Hoc tests are used at the second stage of the analysis of variance (ANOVA) or multiple analysis of variance (MANOVA) if the null hypothesis is rejected. If the significant difference was identified by One-Way Anova then Post Hoc tests can be employed to implement the Anova test in order to identify where the difference lays.

**SME**

Small and Medium Enterprise

**Small firms**

A firm employs less than 50 staff.

**UK SIC codes**

The UK Standard Industrial Classification codes are used to classify business establishments and other statistical units by the type of economic activities they are engaged in.

**Variable factors**

A list of factors that used to identify a firm's e-business/e-commerce performance. Those factors are likely to influence the success of e-business adoption and development directly and they are likely to be improved through a firm's awareness and action within the short period of time.

**Web-marketing**

Web marketing is the general term for marketing done on the Internet. It's basically a computer-based version of traditional marketing objectives that involve a product, price, packaging, promotion and place. Marketing is ultimately about propelling a product or service through the proper channels and web marketing uses the Internet as that channel.