

**THE USE OF THE INTERNET  
IN  
SMALL TO MEDIUM-SIZED ENTERPRISES**

**JAPHET EKE LAWRENCE**

Information Systems Research Centre

Information Systems Institute

University of Salford

Salford UK

Submitted in Partial Fulfilment of the Requirements of the Degree of  
Doctor of Philosophy, June 2002

# TABLE OF CONTENTS

<b>List of Figures</b>	<b>viii</b>
<b>List of Tables</b>	<b>ix</b>
<b>Acknowledgements</b>	<b>x</b>
<b>Declaration</b>	<b>xi</b>
<b>Abstract</b>	<b>xii</b>
<b>CHAPTER ONE: Introduction</b>	<b>1</b>
<b>1.1 The importance of Internet to organisations</b>	<b>3</b>
<b>1.2 Small to Medium-sized Enterprises</b>	<b>5</b>
<b>1.3 Research questions</b>	<b>6</b>
<b>1.4 Definitions</b>	<b>8</b>
<b>1.5 Delimitation of scope and key assumptions</b>	<b>8</b>
<b>1.6 Outline of the thesis</b>	<b>8</b>
<b>1.7 Conclusion</b>	<b>10</b>
<b>CHAPTER TWO: Background</b>	<b>11</b>
<b>Introduction</b>	<b>11</b>
<b>2.1 The Origins, Growth and Commercialization of the Internet</b>	<b>11</b>
<b>2.2 Internet users</b>	<b>14</b>
<b>2.3 The current Internet business models</b>	<b>17</b>
<b>2.4 Research into business use of the Internet</b>	<b>23</b>
<b>2.4.1 Studies of SMEs use of the Internet</b>	<b>26</b>
<b>2.4.2 Difference between this study and past studies</b>	<b>28</b>
<b>2.5 Small to Medium-sized Enterprises (SMEs)</b>	<b>30</b>

2.5.1	SMEs' information systems capability	32
2.5.2	SMEs characteristics	34
2.5.3	SMEs and the Internet	39
2.5.3.1	Potential opportunities available to SMEs	43
2.6	Conclusion	47
 <b>CHAPTER THREE: Literature Review</b>		<b>49</b>
	Introduction	49
3.1	Diffusion of innovation theory	52
3.1.1	Explanation of diffusion theory	54
3.1.2	Criticisms of diffusion theory	57
3.2	Technology acceptance model	59
3.2.1	Explanation of technology acceptance model	61
3.2.2	Limitation of technology acceptance model	62
3.3	Information richness theory	64
3.3.1	Explanation of information richness theory	64
3.3.2	Empirical evidence	68
3.3.3	Relevance to the Internet	71
3.4	Social influence model	73
3.4.1	Explanation of social influence model	74
3.4.2	Empirical evidence	78
3.4.3	Relevance to the Internet	79
3.5	Conclusion	80

<b>CHAPTER FOUR: Research Process</b>	<b>82</b>
<b>Introduction</b>	<b>82</b>
<b>4.1 Philosophical assumptions of positivism and interpretivism</b>	<b>82</b>
<b>4.1.1 Positivist perspective</b>	<b>84</b>
<b>4.1.2 Interpretive perspective</b>	<b>85</b>
<b>4.2 Research approaches</b>	<b>87</b>
<b>4.2.1 Quantitative research</b>	<b>87</b>
<b>4.2.2 Qualitative research</b>	<b>89</b>
<b>4.2.3 Taxonomy of research approaches</b>	<b>90</b>
<b>4.3 Research method chosen for this study</b>	<b>94</b>
<b>4.3.1 Survey method</b>	<b>96</b>
<b>4.3.2 Case study method</b>	<b>97</b>
<b>4.3.3 Limitation of research method</b>	<b>99</b>
<b>4.3.4 Justifications for using mixed-methodology approach</b>	<b>103</b>
<b>4.4 Data collection</b>	<b>107</b>
<b>4.4.1 Survey design</b>	<b>108</b>
4.4.1.1 Sample and procedure	109
4.4.1.2 Measure	110
<b>4.4.2 Case study design</b>	<b>111</b>
4.4.2.1 Case participants	113
4.4.2.2 Interview	114
4.4.2.3 Secondary data	116
<b>4.5 Data analysis</b>	<b>117</b>
<b>4.5.1 Grounded theory</b>	<b>119</b>
4.5.1.1 Reasons for using grounded theory for data analysis	121
<b>4.5.2 Grounded theory procedures</b>	<b>123</b>
4.5.2.1 Coding	124
4.5.2.2 Memo writing	126
4.5.2.3 Theoretical Sampling and comparing	127
<b>4.6 Conclusion</b>	<b>129</b>



<b>CHAPTER FIVE: FIELD STUDIES: Survey Questionnaire</b>	<b>131</b>
<b>Introduction</b>	<b>131</b>
<b>5.1 Background summary of respondents</b>	<b>131</b>
<b>5.2 Analysis of the survey questionnaire</b>	<b>133</b>
<b>5.2.1 Internet use in SMEs</b>	<b>133</b>
<b>5.2.2 Benefits</b>	<b>137</b>
<b>5.2.3 Barriers</b>	<b>138</b>
<b>5.3 Discussion of the survey findings</b>	<b>139</b>
<b>5.3.1 Current Internet usage in SMEs</b>	<b>139</b>
<b>5.3.2 Internet as a medium of communication</b>	<b>142</b>
<b>5.3.3 Internet as an advertising and marketing tool</b>	<b>144</b>
<b>5.3.4 Internet as a competitive tool</b>	<b>145</b>
<b>5.3.5 Benefits of using the Internet</b>	<b>146</b>
<b>5.3.6 Barriers hindering the use of the Internet</b>	<b>148</b>
<b>5.4 Classification of SMEs according to Internet usage</b>	<b>150</b>
<b>5.5 Comparison of this survey with other surveys conducted in the UK</b>	<b>152</b>
<b>5.6 Conclusion</b>	<b>156</b>
<b>CHAPTER SIX: FIELD STUDIES: Case Study Analysis</b>	<b>160</b>
<b>Introduction</b>	<b>160</b>
<b>6.1 Case studies analysis</b>	<b>161</b>
<b>6.1.1 Propositions that emerged from the data analysis</b>	<b>164</b>
<b>6.2 Results of case studies analysis</b>	<b>166</b>
<b>6.2.1 Decision to adopt the Internet</b>	<b>168</b>
<b>6.2.2 Technological factors</b>	<b>169</b>
6.2.2.1 Compatibility	169
6.2.2.2 Cost-effectiveness	171

6.2.2.3	Benefits of using the Internet	173
6.2.2.4	Perceived richness of the Internet	184
6.2.2.5	Perceived usefulness of the Internet	185
6.2.2.6	Perceived ease of use of the Internet	187
<b>6.2.3</b>	<b>Organisational factors</b>	<b>188</b>
6.2.3.1	Management Support	188
6.2.3.2	Organisational resources	192
6.2.3.3	Organisational size	194
<b>6.2.4</b>	<b>Environmental factors</b>	<b>195</b>
6.2.4.1	Competitive pressure	195
6.2.4.2	External pressure	198
<b>6.2.5</b>	<b>Barriers to Internet adoption</b>	<b>201</b>
6.2.5.1	Security	201
6.2.5.2	Lack of Internet knowledge	204
6.2.5.3	Complexity	206
6.2.5.4	Cost of investment	207
6.2.5.5	Limitation of infrastructure	208
6.2.5.6	Uncertainty about the Internet	209
6.2.5.7	Limitation of personal contact	210
6.2.5.8	Lack of universal electronic payment systems	211
<b>6.3</b>	<b>Conclusion</b>	<b>212</b>
<b>CHAPTER SEVEN: Summary and Conclusions</b>		<b>214</b>
	<b>Introduction</b>	<b>214</b>
<b>7.1</b>	<b>Summary of research process</b>	<b>214</b>
7.1.1	Summary of thesis chapters	214
7.1.2	Review of research questions	218
7.1.3	Review of research methodology	221
<b>7.2</b>	<b>Discussion of case study findings</b>	<b>223</b>
7.2.1	<b>Technological factors</b>	<b>224</b>
7.2.1.1	Diffusion of innovation theory	224
7.2.1.2	Technology acceptance model	226
7.2.1.3	Information richness theory	227
7.2.1.4	Social influence model	229
7.2.2	<b>Organisational factors</b>	<b>230</b>
7.2.3	<b>Environmental factors</b>	<b>231</b>

7.2.4	<b>Barriers to Internet adoption</b>	<b>232</b>
7.2.5	<b>Limitations of theories</b>	<b>233</b>
7.2.6	<b>Extension of diffusion theory and technology acceptance model</b>	<b>236</b>
7.2.7	<b>Revised integrated model of SMEs' Internet adoption</b>	<b>238</b>
7.3	<b>Conclusion about the research problem</b>	<b>241</b>
7.3.1	<b>Survey questionnaire</b>	<b>241</b>
7.3.2	<b>Case study</b>	<b>244</b>
7.4	<b>Evaluating interpretive research</b>	<b>246</b>
7.5	<b>Contribution of the research</b>	<b>250</b>
7.6	<b>Implications of research findings</b>	<b>253</b>
7.6.1	<b>Implications for research</b>	<b>254</b>
7.6.2	<b>Implications for practice</b>	<b>256</b>
7.7	<b>Limitations of the study</b>	<b>258</b>
7.8	<b>Further research</b>	<b>258</b>
7.9	<b>Reflection on the experience of conducting this research</b>	<b>260</b>
7.10	<b>Conclusion</b>	<b>263</b>
	<b>BIBLIOGRAPHY</b>	<b>265</b>
	<b>APPENDICES</b>	<b>297</b>
Appendix 1	<b>Sample Cover Letter for Questionnaire</b>	<b>298</b>
Appendix 2	<b>Sample follow-up Letter for Questionnaire</b>	<b>299</b>
Appendix 3	<b>Survey questionnaire</b>	<b>300</b>
Appendix 4	<b>Sample Request letter for Interview</b>	<b>305</b>
Appendix 5	<b>Sample availability form for interview</b>	<b>306</b>
Appendix 6	<b>Sample Interview guide</b>	<b>307</b>

<b>Appendix 7</b>	<b>Sample extracts from the interviews</b>	<b>308</b>
<b>Appendix 8</b>	<b>How grounded theory was applied to the case study</b>	<b>313</b>
<b>Appendix 9</b>	<b>Background summary of SMEs that participated in this study</b>	<b>315</b>
<b>Appendix 10</b>	<b>Glossary</b>	<b>317</b>

## **List of Figures**

Figure 3.1 Communication Media and Information Richness	66
Figure 3.2 Characteristics of media that determine richness of information	66
Figure 3.3 A Social Influence Model of Media Use	75
Figure 4.1 Information systems research approaches	91
Figure 4.2 Outline of research approach	96
Figure 5.1 Main use of the Internet among surveyed SMEs	133
Figure 5.2 Internet resources used most in business	134
Figure 5.3 Reasons for not using the Internet	135
Figure 5.4 Reasons for not advertising on the Internet	136
Figure 5.5 Benefits of using the Internet	138
Figure 5.6 Percentage of respondents by company size	140
Figure 6.1 SME Internet Adoption Model	168
Figure 6.2. A framework of benefit in the context of SMEs	175
Figure 7.1 Revised Integrated Model of SME Internet Adoption	239

## **List of Tables**

Table 2.1 Internet business models (1)	19
Table 2.2 Internet business models (2)	21
Table 2.3 Summary characteristics of the specificity of SMEs	37
Table 3.1 Comparison of assumptions	75
Table 4.1 Difference between positivist and interpretivist epistemology	84
Table 4.2 Details of SMEs that participated in the case study	114
Table 5.1 Demographic profile of respondents	132
Table 5.2 Barriers hindering Internet use	138
Table 5.3 Main use of the Internet by Company size	141
Table 5.4 Reason for not using Internet for advertising by company size	145
Table 5.5 Benefits of using the Internet by company size	147
Table 5.6 Cross tabulation of Main use of the Internet by Internet Web site; Internet resources by Internet Web site; and Benefits by Internet Web site	151
Table 5.7 Summaries of Spectrum (DTI, 1998) and Continental Research (OfTel, 2000) surveys	152
Table 5.8 Survey results on Internet usage	155
Table 5.9 Summary of survey findings	159
Table 6.1 List of participating SMEs	161
Table 6.2 Core categories and subcategories that emerged from the data analysis	164
Table 6.3 Propositions that emerged from the data analysis	166
Table 7.1 Framework of SME Internet adoption	246
Table A.1 Sample of the initial concepts that emerged from the analysis of the first SME case	314
Table A.2 Across case pattern comparison	314

## ACKNOWLEDGEMENTS

First and foremost I wish to acknowledge Professor A.T Wood-Harper, my supervisor, for all his encouragement and support. I would also like to thank my advisor Dr J. Hughes for his guidance, support, insight and steady encouragement throughout this research. Without him I could never have kept this project on course.

I deeply appreciate all the time and information provided by the respondents of the companies that I surveyed during the course of this project. I especially want to thank the companies that allowed me to use their companies as 'case studies', their insights and experiences form the core of this thesis. Concerns for confidentiality precludes me from mentioning their names, but their contributions were critical to the success of the research.

I would like to express my sincere thanks to my mother Claris for her moral support and encouragement throughout my academic pursuit. It is my pleasure in expressing my thanks and appreciation to Jeanette and Nancy for making time to review and comment on my work. Finally, there are no words to measure up the thanks due to my children Jeff and Faye without their support and tolerance none of this would have been possible. They have contributed understanding and enthusiasm through long stretches of research and writing. I salute them from the bottom of my heart.

## **DECLARATION**

No portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university of other institution of learning.



## **ABSTRACT**

Information technology, particularly the Internet has the potential to radically change the way business is conducted, offering a competitive edge and a gateway to the global marketplace. The explosive growth and commercialisation of the Internet has opened up a vast arena providing more opportunities for businesses, particularly SMEs to sell their products and service to a global audience than they would have been able to afford to reach using the traditional methods. There is tremendous potential for SMEs to harness the power of the Internet to improve their productivity and sharpen their competitive edge in both local and international markets. The Internet is viewed as a means through which SMEs could extend their geographic reach at minimal cost and to integrate and expand their business practices globally. Through such means it is argued that small companies could compete effectively against larger firms as the Internet is believed to be a great equaliser. The contribution of SMEs is extremely important to the economy of many countries and their contribution cannot be over emphasised. SMEs account for more than 50% of private sector employment in the UK and are currently contributing most of the private sector employment growth.

This research reports on the empirical study of SMEs usage of the Internet. The intention is to present evidence on the current status of Internet use among SMEs and show the factors that influence their decision to adopt the Internet in business.

Although the Internet has experienced tremendous growth world wide, very little empirical research has been conducted to examine this phenomenon in SMEs context. Questions about what SMEs are using the Internet for and what is driving them to use the technology in their business are still lacking. It is therefore of importance that insight be gained into how SMEs are currently using the Internet and the factors that influence their decision to adopt the Internet in business. In order to achieve these objectives, the research uses a quantitative and qualitative approach in order to provide an in-depth description of how SMEs currently use the Internet and the factors that influence their decision to adopt it.

A questionnaire was used to survey 400 SMEs in the UK and 92 usable response (23%) were received. The survey result shows that communication, customer services, information gathering, and advertising are the areas the Internet is used most in SMEs. While the case study result shows that technological, organisational and environmental factors influence SMEs' decision to adopt the Internet. These factors are used to develop a theoretical model for conceptualising the organisational issues around the adoption and use of the Internet--issues that have been largely missing from contemporary discussions of Internet usage in SMEs. The study thus has important implications for research and practice. Specifically, the theoretical model and findings suggest that technological and organisational factors, rather than environmental factors, play a significant role in Internet adoption. Similarly, the study suggests that practitioners will be better able to adopt the Internet in business, if they understand how these factors influence its adoption and usage. The limitations of the study, the contributions of the research, the implications of the research findings and future research are discussed.

# CHAPTER ONE

## INTRODUCTION

This chapter presents an overview of the ideas and issues which form the basis of the thesis. Many of the issues raised are dealt with in depth later in the thesis, but it will suffice at this stage to give a flavour of what is to come.

The primary concern of this study is the adoption and usage of the Internet in small to medium-sized enterprises (SMEs). The study focuses on how SMEs currently use the Internet and the factors that influence their decision to adopt Internet technology in business. The study is limited to SMEs because, unlike their large companies' counterpart, they account for more than 50% of private sector employment in the UK and are currently contributing most of the private sector employment growth (DTI, 1998). The purpose of this research is to generate a grounded theory, not to test a theory that has been determined a priori. It aims to build on the work done so far by using grounded theory method to develop a theory designed to increase the understanding of the factors that influence SMEs' decision to adopt and use the Internet in business.

The introduction of new technology frequently presents unfamiliar problems as well as immense opportunities in organisations; the Internet is no exception. In an increasingly global world, both information and information technology are of great significance to organisations of all sizes. Businesses need information to succeed in today's rapidly changing environment, they need to be able to process data and use information effectively when conducting their day-to-day operations. The use of IT has the potential to play an increasingly important role in organisations in enabling them to substantially gain competitive advantage and compete successfully. Its use can add significant value to an organisation in terms of productivity increase and performance improvements (Kang, 1998).

Research on managerial and organisational use of information technologies is extensive and has been central to the field of information systems (IS) since its

inception (Ngwenyama and Lee, 1997). The vast majority of this research has been characterised by the application of traditional quantitative methodologies. Experiments and descriptive questionnaire surveys in large-N studies have been the norm. The findings from quantitative research conducted during the past few years have contributed significantly to the understanding of IT usage in organisations. The impact of IT on organisations, its implementation and information management research has been favoured areas for investigation.

There are, however, increasing calls for more qualitative research in the field of IS (Walsham, 1993, 1995; Myers, 1997; Markus, 1987). Markus (1987) stated that "there are many topics in IS that are best explored by means of qualitative methods of inquiry". These include investigations into deep understanding of the impact of technology and evaluating technological innovations in organisations. Despite these calls, Markus (1987) observed that "there have been relatively few published qualitative research studies on the theme of IT usage in organisation, much of the research to date has been technical or descriptive in nature, despite the prominent impact of qualitative research on IS research more generally". Currently, research into non-technical aspects of Internet usage in SMEs' has been largely ignored in most available literature. The majority of research to date addresses the Internet as it is being used, such as demographic use of the Internet (GVU, [http://www.cc.gatech.edu/gvu/user\\_surveys](http://www.cc.gatech.edu/gvu/user_surveys); Abell and Lim, 1996) and not necessarily why it is adopted and used in organizations. Furthermore, the literature shows to date, no theory of Internet adoption in SMEs has been established. While models of information technology implementation do exist (Ginzberg, 1981; Markus, 1983) these deal largely with the development stages of IS implementation and focus extensively on user involvement and user relations. As a result, they are less applicable to the case of Internet adoption and use in SMEs.

Orlikowski (1993) has examined the adoption of case tool in organisation. As Orlikowski points out "most IT usage studies have focused on descriptions of Internet usage". Most data has been collected via semi-structured interviews or surveys and used for descriptive purposes and very little theory development or testing has been reported in this area (Brancheau and Wetherbe, 1990). More research of a qualitative nature is needed to gain a greater understanding of the phenomenon of IT adoption

from the perspectives of the people involved in their natural settings. We need "in-depth, penetrating investigation that strives for relational understanding of all the various factors that comprise and affect the object of the study" (Wolf, 1979).

Literature survey shows that there are many gaps in terms of knowledge and understanding of the factors that influence Internet adoption, in particular there is a lack of attention to the contextual aspect of Internet adoption in organisation. Hence, some of the possible unexplored areas of past research relate to the adoption and usage of the Internet and its impact on the organisation. It is therefore hoped that this research will try to fill this gap, by conducting an empirical study that examines the factors which influence the decision of SMEs to adopt and use the Internet in business. The author argues that research on Internet usage in SMEs has reached a stage where theory development is critical to the accumulation of new knowledge. The development of theory about Internet adoption, grounded in data gathered from SMEs will contribute significantly to the field of IS and guides in the development of policy for the adoption of the Internet in organisation.

This research adds to the body of knowledge that explores the relationship between factors in an organisation and IT adoption success. It builds on the work of Orlikowski (1993) and Orlikowski and Baroudi (1991) and it extends the stream of information systems research utilising qualitative techniques (Calloway and Ariav, 1990; Calloway and Ariav, 1995; Lee, 1989; Lee, 1991; Martin and Turner, 1986; Orlikowski, 1993).

### **1.1 The importance of Internet to organizations**

The use of the Internet in organisations has been the focus of many research studies because of its importance in improving organisation performance (Bloch and Segev, 1996). Businesses both large and small have seized the opportunity to explore its use and become more productive and competitive (Poon and Strom, 1997). The Internet is said to fundamentally re-shape the course of businesses (Zwass, 1996). It is heralded and promoted as technology, which has the potential to profoundly affect how businesses are conducted and how information is accessed (Clemente, 1998; Vadapalli and Ramamurthy, 1997).

The Internet is already being put to a myriad of different uses: educational, recreational, commercial etc. According to Bloch, Pigneur and Segev (1996), the explosive growth and commercialisation of the Internet has led to widespread usage of online services such as shopping, audio and video applications including telephony and videoconferencing. Burgess and Cooper (1999) point out that being connected to the Internet has become a priority for both large and small companies. Research indicates that commercial activities now account for a large proportion of growth of the Internet (<http://www.commerce.net>), it offers an increasingly diverse platform for innovative ways of doing business and new opportunities through which organisations can conduct commerce electronically (Golden and Griffin, 2000). It also offers opportunities to businesses that transcend those of the traditional media; for example easy access to global markets (Department of Trade and Industry - DTI, 1998). The rapid adoption of the Internet as a commercial medium has motivated firms to experiment with innovative ways of marketing to customers, for example amazon.com the biggest Internet bookstore.

There is tremendous potential for SMEs to harness the power of the Internet to improve their productivity and sharpen their competitive edge in both local and international markets (Chatterjee and Sambamurthy, 1999). The use of Internet technology presents a unique opportunity for SMEs to participate in electronic commerce and to extend their capabilities and grow in a global market. Lymer et al (1997) argue that Internet use is becoming increasingly important as a mechanism to increase productivity, reduce costs and facilitates flexibility in SMEs business. The Internet provides global connectivity based on non-proprietary technology. It allows SMEs to access global markets, foster relationships from a business to business perspective and capture new customers and suppliers (<http://www.johnmcguinness.com/ecommerce.html>). It is easy to access the World Wide Web using low-cost browser software, and it is a relatively low-cost information technology infrastructure. This enables SMEs to be involved in electronic commerce technologies most appropriate to their business requirements (Chatterjee and Sambamurthy, 1999).

This participation is possible due to the absence of barriers to entry (Poon and Swatman 1998). It is argued that the Internet tears down boundaries of time and

space, enabling smaller firms to create entirely new businesses and reach markets they never could have reach before (Quelch and Klein 1996). This opportunity for global reach is being enthusiastically embraced by small and medium sized firms as evidenced by O'Connor and O'Keefe (1997) who found that SME are firstly building web sites to attract new customers, to maintain and strengthen relationships with current suppliers and customers through increased interaction. The Internet global reach and its range of services (e.g. information dissemination, interactive communication, and transactional support) make it a potentially powerful business resource (Chatterjee and Sambamurthy). The Internet presents an arena in which small companies can create an electronic commerce strategy that can enable them to compete effectively against large companies.

Despite the unprecedented growth in the use of the Internet by organisations, there are some unresolved issues that have accompanied the growth of the Internet such as security of information and legal issues (Clarke, 1996). Added to these are technology problems such as the lack of standards and overloaded communication lines (Auger and Gallagher, 1997), resulting in inaccessibility of sites and sources of information and poor response times (Vadapalli and Ramamurthy, 1997).

## **1.2 Small to Medium-sized Enterprises (SMEs)**

Since the commercialisation of the Internet, Internet commerce has evolved as a key development, which promises to change the future of the global economy (Poon and Swatman, 1998). As a result, there has been a concomitant upsurge of research studies into different aspects of Internet commerce (Quelch and Klein, 1996). The literature shows that few of these studies have focussed on the usage of Internet in organisations. However, there is little or no evidence at present that indicates the factors that influence SMEs to adopt and use this technology.

Therefore the choice of SMEs as the main context of this research is not arbitrary. It is chosen because of the important role SMEs play in the UK economy. There are clear indications that an increasing number of UK SMEs are responsible for creating jobs and an increasing number of SMEs are experiencing the phenomenon of Internet usage in business. SMEs are extremely important to many countries, in some countries these group of organisations provide the foundation for the entire economy

(Mason, 1997), their contribution to the economy cannot be over emphasised. SMEs comprise firms that make up a significant proportion of UK industry (99.8%, DTI Statistics; Oftel, 2000). They account for more than 50% of private sector employment in the UK and are currently contributing most of private sector employment growth (DTI, 1998).

As mentioned earlier, the literature shows little or no empirical research has been conducted to enrich knowledge within this area. Surveys that have been conducted by the European Commission clearly demonstrate that the use of electronic commerce provides SMEs with substantial benefits in several areas crucial for their business success (Vassilopoulou, Keeling, Macaulay, and McGoldrick, 2000). Other studies (Behrendorff and Goldsworthy, 1996) have shown that the use of appropriate electronic commerce technologies by SMEs can be an important factor in facilitating business growth, contribute to productivity, efficiency, and enable access to global markets by eliminating the constraints previously imposed by geographic boundaries.

Given the strategic importance of the SME sector to growth and job creation and the large base of current Internet users as well as potential users, the success of SMEs gaining business leverage from the Internet is critical to the future of global economies (Poon and Swatman, 1999; Prerost, 1997). It is therefore of importance that insight be gained into the issues affecting the adoption and use of Internet technology in SMEs. Furthermore, knowing the factors that influence adoption of the Internet would explain why SMEs adopt or do not adopt this phenomenon, leading to a better picture of Internet adoption in this group of organisations. *An understanding* of the factors that influence their decision to adopt the Internet in business may provide an avenue for policy-makers and practitioners to influence the rate of adoption of the Internet and consequently, the speed of electronic commerce.

### **1.3 Research questions**

The main concern of this research is the use of Internet technology by small to medium-sized enterprises. The study is cross-sectional in nature and the data for this study was collected over a six-month period, between March and August 2001. The objective of the study is to contribute toward a fuller understanding of Internet adoption and use in SME setting and hence contribute to the cumulative body of



research in this area. To achieve this, the study proposes a more enriched model for conceptualising the technological, organisational, environmental and contextual issues around the adoption and use of the Internet--issues that have been largely missing from contemporary discussions of Internet usage (Orlikowski, 1993).

In order to realise this research objective the study, especially the data-gathering process, is guided by the following research questions:

1. How do SMEs currently use the Internet?
2. What are the benefits that may be gained from the use of the Internet?
3. What are the possible barriers that may prevent them from using the Internet?
4. What are the factors that influence their decision to adopt the Internet?

Because the adoption and use of the Internet in SMEs has received little or no prior attention, the study adopted a two-phased approach to provide answers to the above questions. Phase one is based on a review of the literature. Following this review a survey questionnaire of 400 randomly selected SMEs is conducted across the UK, to elicit information regarding the current status of Internet usage in SMEs. The aims of using the survey are: (1) to describe how SMEs use the Internet (2) to examine the benefits that may be gained from the use of the Internet and (3) to examine some of the possible barriers that prevent SMEs from using the Internet. The survey method is chosen because of its ability to handle a large sample size and a large number of variables simultaneously (Galliers, 1992). While this survey method is very useful, Kraemer and Dutton (1991) suggest that it is greatly improved when used in conjunction with the case study method.

Phase two of the study is carried out using multiple case studies of SMEs that have previously completed the questionnaire in phase one. The case study phase is based on the results of the survey questionnaire and further review of the literature. The aim is to gain a deeper insight into the issues raised in the survey questionnaire and to understand the factors that influence SMEs decision to adopt and use the Internet in business. It is also used to explain and conceptualise the phenomenon of Internet usage and to add a richer dimension to the survey data.

## **1.4 Definitions**

The term Small to Medium-sized Enterprises (SMEs) incorporates two primary classifications i.e. small business and medium business. The Department of Trade and Industry (DTI) defined SMEs as a company employing between 1-249 employees. The current study based on DTI SME defines *small business* thus: independently owned and managed; being closely controlled by owners/managers who also contribute most, if not all, of the operating capital, having the principal decision making functions resting with the owner/manager; with total number of employees less than 50. While *Medium-sized enterprise* is defined as business that is larger than small business and smaller than large business with total employees greater 50 and less than 250. See glossary in appendix 10 for the definitions of the Internet, IT, electronic commerce, web and email.

## **1.5 Delimitation of scope and key assumptions**

Small to medium-sized enterprise is chosen as the context of this research. The focus is on SMEs that have adopted or not adopted Internet technology, and not on the characteristics of particular Internet application (e.g. email or web). The experiences of these organisations may differ from the experiences of larger organisations. The study is limited to the examination of how SMEs currently use the Internet and the factors that influence their decision to adopt Internet technology in business. The study is not concerned with the implementation of the Internet in the workplace nor is the aim of this research to examine the process through which an SME passes from first knowledge of the Internet, to developing an attitude toward the Internet, to a decision to adopt or reject to implementation of the Internet, and to confirmation of this decision. It provides an organisational account of the factors that influence adoption of the Internet in SMEs.

## **1.6 Outline of the thesis**

The thesis is organised into seven chapters. The remainder of the thesis will develop the argument, which has been outlined in this introductory chapter. Chapter 2 provides background information about the SME use of information technology in general and the Internet in particular. Then a brief history and evolution into what today is known as the Internet will be described, including the WWW. The chapter

then considers the current Internet business models and the business use of the Internet.

Chapter 3 presents different theoretical perspectives that are relevant in explaining the adoption and use of the Internet in SMEs. The chapter draws upon work on diffusion of innovations (Rogers, 1983), technology acceptance model (Davis, 1989), information richness theory (Daft and Lengel, 1984, 1986) and social influence model (Fulk et al., 1987, 1990, 1991, 1993).

Chapter 4 defines the boundaries of research methods that are considered for this study. It discusses the research methodology and evaluates the selection of the chosen research method adopted for this study. The chapter begins by providing a review of the philosophical assumptions of the research within the field of information systems, outlining the difference between positivism and interpretivism. Then the choice of research method is presented and the justification for choosing mixed methodology approach is given. The chapter then discusses the research design, the descriptions of the field procedures, which include survey procedures and case studies, and the strategy utilised for data collection and analysis. Finally, the chapter accounts for the choice of grounded theory technique and describes its basic operations.

Chapter 5 presents the analysis and findings of the survey questionnaire phase of the research. The second phase is carried out using multiple case studies (presented in chapter 6) to enable the author to elicit qualitative information to complement the shortcomings of the survey research method.

In chapter 6 the SME cases that participated in the study are presented. The accounts of Internet usage in the participating SMEs are analysed and described using grounded theory techniques. The chapter proposes an enriched theoretical model that explains the adoption and use of the Internet in SMEs and discusses the research findings with the existing literature.

Chapter 7 is the concluding chapter that summarises the overall findings and formally evaluates the research study. The chapter begins by summarising the research process including the research problems and research methodology. The conceptual model is

then revisited and reconsidered in the light of the literature review and the empirical findings. The overall conclusions from the study are drawn in terms of key findings and their implications for practice and for research. The contribution of the research is presented and the chapter identifies some areas for further research. Finally, the chapter reflects on the experience of conducting this research.

## **1.7 Conclusion**

This chapter has laid the foundation for the thesis. It introduced the research problem and questions. The definitions were presented and the thesis was outlined and the limitations were given. On these foundations, the thesis can proceed with a detailed description of the research.

# CHAPTER TWO

## BACKGROUND

### Introduction

Chapter 1 presented an overview of the ideas and issues, which formed the basis of the thesis. The aim of this chapter is to discuss the Internet and small to medium-sized enterprises which form the background to this research. First, a brief origin, growth, and commercialisation of the Internet will be presented, followed by the demographic and behavioural characteristics of Internet users. The difference between this study and past studies is presented. The existing Internet business models, research into business use of the Internet and studies of SMEs use of the Internet are discussed. The reason for choosing SMEs as the context of this study was briefly discussed in section 1.2 of chapter 1. This chapter aims to build on that discussion and describe SMEs information systems capabilities, identify the distinctive characteristics that differentiate SMEs from the large organisation and finally, the SME use of the Internet and the opportunities it offers to them.

### 2.1 The Origins, Growth and Commercialisation of the Internet

This study uses the term “Internet” to refer synonymously to the Internet, WWW, emails and associated technology and application domains. While the Internet provides the underlying infrastructure, growth in these technologies and applications is spawned by new and innovative approaches to communicating and doing business via the Internet. The Internet has grown from being a tool for individuals and researchers to a mass medium for organisations and societies at large. The origins, growth and evolution of the Internet are presented in this section as background to the rest of the thesis. A more detailed historical overview and discussion of the Internet demographics can be found in Hobbes (1996); Hoffman and Novak (1995); Commerce Net/Nielsen (1995); FIND/SVP (1996); and Network Wizard (1996).

The Internet is a global network of inter-linked computers operating on a standard protocol which allows data to be transferred between otherwise incompatible machines. The Internet is defined as a network of networks, which interchange data

using a set of communication standards, called the Internet Protocol Suite (IPS), in particular Transport Control Protocol/ Internet Protocol (TCP/IP). It consists of thousands of computer networks at businesses, universities, and governmental agencies all linked together by phone lines, microwave transmissions, or fibre optics (Leiner et al, 1998).

The origins of the Internet date back to the early 1960s when the US Defence Department established the Advanced Research Projects Agency (ARPAnet) to link various military and research institutions. One of its major achievements was the development of a standard protocol, which allowed dissimilar computer systems to communicate. This protocol, known as TCP/IP (Transmission Control Protocol/ Internet Protocol) remains the most commonly used on the Internet today. During the late 1980s, the National Science Foundation (NSF) used the ARPAnet technology to expand its own NSFNET - a high speed backbone network linking campuses and research centres to the NSF's supercomputers.

The Internet came to the world's notice in the 1990's. Since its inception in the 1960s, the Internet has evolved from a communications medium reserved for elite researchers and scientists to a highly sophisticated commercial medium (Sim and Rudkin, 1997). As public interest exploded in the 1990's, the Internet was opened up to other groups, including individuals and companies. Full commercial Internet connections became available in 1991 with the establishment of the Commercial Internet Exchange. This led to a proliferation of commercial sites, which remain the fastest growing part of the Internet today.

The Internet has grown explosively, from only 1000 networks in 1990 to 488,000 networks in July 1996 (Lotter, 1996). In 1995, International Data Corporation (IDC) estimated that there were some 38 million users in 150 countries who were communicating, researching, and shopping on the Internet. Global growth continues to surge at a phenomenal rate. Furthermore, this astronomical growth continues to add value to the Internet, since each new participating individual, organisation, and firm adds incremental benefits to the network (Bakos, 1991). This provides a self-perpetuating incentive drawing more users and providers into the network.

The size of the Internet in terms of number of users has been one of the most contentious issues surrounding its development as a consumer medium. The figures regarding the number of people using the Internet vary almost as much as the number of citations. However, they all make the same basic point that the growth rate is of immense proportions. Internet usage around the world is doubling every ten days <http://www.nw.com/zone/www/report.html>. In 1996, IDC estimated the number of Internet users world wide at 80 million. In 2000, Reid estimated 450 million user world wide, reaching 1 billion users by the year 2005. The Internet can no longer be considered a “fad”. According to Angus Reid, the Internet is a technology whose design has been written in an indelible ink, with an estimated of 450 million users world wide, the Internet is truly a force to be reckoned with (Reid, 2000, <http://www.angusreid.com>).

Although the original purpose of the Internet was for Universities and Governmental agencies to share information, companies have quickly taken over the Internet. According to <http://www.commerce.net>, commercial businesses are not only the largest, but have become the fastest growing segment on the Internet. One half of the traffic on the Internet originates from commercial sites (identified by the .com extension) who make up the largest percentage of Internet hosts (Lotter, 1995). This increased usage by the business world is a major contributor to the Internet's growing popularity and size.

Much of the explosive growth of the Internet can be attributed to the multimedia hypertext environment known as the World Wide Web. Since the introduction of the Web in 1992, "the Internet has nearly doubled in size every year" (Cerf, 1995), far exceeding the growth rates of all previous communications technologies including VCR, television, radio and conventional telephone (Clemente, 1998). The World Wide Web has been touted as 'the kill app', the one Internet application which brought the Internet, and all that it offers, to the masses. It is the web, which attracted a much broader spectrum of users and led to the explosive growth of recent years. It also helped transform the Internet into a global information service, which has led to further dramatic growth in its user population (Sim and Rudkin, 1997).

The Web offers an easy-to-use graphical user interface to an otherwise dreary text-based Internet, allowing marketers to add colour, audio and pretty pictures to their sales pitches (Neely, 1996). It enables information, including text, audio, video and graphics to be accessed anywhere on the Internet using a browser program. It makes use of HTML (Hypertext Mark-up Language) and HTTP (Hypertext Transfer Protocol) to give access to documents at many different physical locations. Regardless of the type of server, the user interface is the same; users traverse the network by moving from one document to another via hypertext links. The Web makes publishing, display and retrieval of all kinds of media as easy as clicking a mouse. This ease of use, combined with the availability of free software and the existence of a large networked community made the www irresistible. The Web currently accounts for the greatest increase in Internet network traffic.

## **2.2 Internet users**

The aim of this section is to provide insights into the demographic and behavioural characteristics of Internet users and how those characteristics have changed over time. Understanding the Internet from a user perspective makes it possible for any organisation in the developmental or re-evaluation stages of an Internet business strategy, to understand the changing dynamics of the online industry (Clemente, 1998).

The Internet, which had started out as "just another research project" (Cerf, 1995) has demonstrated astronomical growth. The explosive growth and commercialisation of the Internet has led to widespread usage of on-line services, and being connected to the Internet has become a high priority for both large and small companies (Burgess and Cooper, 1999). It is not uncommon to see newspapers, magazines, and books giving statistics on the size of the Internet. Measuring and describing the Internet population is a big issue for businesses who need to know the number of people using the Internet, to enable them to make strategic investment decisions regarding the Internet. Given the dynamic nature of the Internet, it is impossible to accurately count all of the hosts and users of the Internet. The number of people on the Internet is expected to increase tenfold from 100 million to 1 billion by 2005 (<http://www.angusreid.com>; <http://www.nw.com/zone/www/report.html>). Several studies have been performed to date that attempt to address the issue of who is on the



Internet and what they are doing there. A good summary of many of the studies available can be found at CyberAtlas (1996).

There is other research currently going on to find out who is on the Internet and their demographic makeup. At the moment, there are regular surveys of the average Internet user (for example, Georgia Institute of Technology's Graphic, Visualisation, and Usability Centre, [http://www.cc.gatech.edu/gvu/user\\_surveys/](http://www.cc.gatech.edu/gvu/user_surveys/); CyberAtlas, [http://cyberatlas.internet.com/big\\_picture/demographics](http://cyberatlas.internet.com/big_picture/demographics); Nua Internet Surveys, <http://www.nua.ie/surveys>; Find/SVP & Cyber Dialogue, <http://etrq.findsvp.com>; Angus Reid World Wide, <http://www.angusreid.com>; CommerceNet/Nielsen Media Research Internet Demographic Survey, <http://www.commerce.net/research>). While methodologies for these studies vary, all agreed that the typical Internet consumer is better educated and more affluent than the average.

According to the tenth survey of over 5,000 Internet participants carried out by [http://www.cc.gatech.edu/gvu/user\\_surveys/](http://www.cc.gatech.edu/gvu/user_surveys/)), the demographics of the Internet community are as follows (it is understood that respondents to an Internet survey are more likely to be heavy users): Gender: male 52%, female 49%; Education: 50.1% at least one degree, 80.9% some college experience; Race: 87.2% white; Average age: 37.6 years; Marital status: 47.6% married 31.7% single; and Location: 84.7% North America. Surveys such as this are useful since it is important to acknowledge the characteristics of the primary users of the Internet.

The survey conducted by Strategis Group on Internet user trends in the US found that the number of Internet users in the US had topped 106 million, with 53% of adults using the Internet and 47% of US households having Internet access. Women made up nearly 60% of new Internet users in the US in 1999. According to Strategis the number of female Internet users had tripled in the last 2.5 years. The number of Internet users who accessed the Internet from home was also growing. Strategis found a 43% increase in home users in 1999, and home usage was growing nearly 60% faster than overall usage. Internet use had become a fact of life in the US, with 61% of home users going online at least once a day and half using the Internet more than once a day. Along with increased Internet usage, online shopping was also growing in the

US. The survey found that average monthly spending on online purchases was \$68.50 in 1999. Nearly 40% of Internet users spent an average of more than \$50 per month.

A survey conducted by CommerceNet/Nielsen in 1999 found that of the 46 million adult residents in the UK, 12.5 million of UK adults now use the Internet on a regular basis, of these, 44% log on every day. The study asked those with Internet access how they used the Internet. 40% used the Internet to access information, 27% had purchased goods online whereas 49% had used the Internet to compare the price of goods and services. The CommerceNet survey revealed that "the Internet users' demographic profile in the UK today is very similar to that of North America two years ago. According to Jerome Samson, Director of Technology and Business Strategy at Nielsen Media Research. "The UK Internet users, however, are embracing e-commerce much more rapidly than users in North America did in 1997" (<http://www.commercenet.org.uk>).

Another study by Angus Reid on 'the face of the web' found that more than 450 million people were using the Internet in the year 2000 and it is estimated to reach 1 billion users by 2005. The 450 million-user figure was based on a study sample of 28,374 Internet users and consumers conducted by telephone in 34 countries. The study found that Internet users remained highly concentrated in a few countries, showed no sign of slowing in several others, and that hundreds of millions of citizens had no immediate intention of going online. 40% of the survey's respondents were aware of the Internet but had no intention of using it in the next 12 months, with the majority of these respondents citing a lack of interest, knowledge, and relevance to their lives.

The US ranked first on most of the categories measured by the Angus Reid study: greatest estimated home PC ownership (107 million), most total Internet users (108 million, similar to Strategis' survey), highest Internet trial (69 percent), highest Internet knowledge (60% claimed to know a "fair amount" about the Internet) and highest Internet usage 59%. The study found the US would also generate the greatest number of future users with an estimated 33 million new users expected to log on. Yet despite the sheer volume of Internet users, the US now represents only 39% of Internet usage world-wide.

Canada ranked second behind the US in many categories, including Internet trial 64%, usage 56%, knowledge 54%, and home PC penetration. In Europe, Germany ranked third in terms of total Internet users with 18 million, and the UK fourth with 14 million. The study found that both Eastern and Southern Europe were showing stalled rates of PC penetration and Internet usage. These countries also had the highest proportions of adults with no interest in going online. In Asia, Hong Kong 35%, Japan 33%, and Singapore 33% made it into Angus Reid's top ten in terms of the percent of the population online. Japan, thanks to its wireless access options and wireless broadband initiatives, was sure to add millions of new users to its 32 million existing users, the study found.

### **2.3 The current Internet business models**

This section summarises some of the existing Internet business models commonly used for commerce. The discussion in this section draws from Timmers (1999) and Hoffman and Novak (1995).

As business activities on the Internet gain momentum, there are an increasing number of research efforts focusing on the impact of the Internet on existing business models (Cronin, 1995; Benjamin and Wigand, 1995; Hoffman and Novak, 1995, 1996; Quelch and Klein, 1996; Timmers, 1999). There is a great deal of interest and enthusiasm in the Internet's potential for commerce. Some analysts have projected that Internet sales will reach the \$12 billion mark by the end of 20<sup>th</sup> century (Hsieh and Lin, 1998). Forester Research found that \$240 million in sales was conducted through interactive media in 1994. Roughly three-quarters of this total was conducted through the on-line services, with the Internet accounting for most of the remainder. While this figure was still significantly smaller than retail and catalogue sales figures, the Internet sales had grown to this level from virtually \$0 in sales in 1993. Anderson (1996) suggested that within three years, Internet commerce would account for ten percent of Internet traffic.

The Internet challenges not only the traditional theories of marketing but also the very practice of marketing itself. It renders obsolete the traditional one-to-many model of mass marketing communication, whereby a firm communicates its message through a medium to a large group of consumers. The Internet presents a different model in

which a many-to-many process exists, and more importantly, consumers can actually interact with the media, unlike television or radio. This means that consumers actively choose whether or not to access a company's web site and "exercise unprecedented control over the management of the content they interact with" (Hoffman and Novak, 1996).

Timmers (1999) defined business model as "an architecture for product, service and information flows, including a description of the various business actors and their roles; a description of the potential benefits for the various business actors; and a description of the sources of revenue". Various Internet business models have been proposed including online storefront, warehouse, Internet presence site, newsgroup mass marketing, content site, mall, incentive site, and search agent (Hoffman and Novak, 1995; Weston, 1995). According to Hoffman and Novak (1995), web sites could be categorised into two major classes: (1) destination sites (or commercial web sites) which comprise ultimate "destinations" competing for consumers' visits (e.g., online storefronts, warehouse, Internet presence sites, newsgroup mass marketing, and content sites). (2) Web traffic control sites which help to direct consumers to the various destination sites (e.g., malls, incentive sites and search agents). While Timmers (1999) identified the following business models: E-shops, E-procurement, E-malls, E-auctions, Virtual Communities, Collaboration Platforms, Third party Marketplaces, Value-chain Integrators, Value-chain Service Providers, and Information Brokerage, Trust and Other Services. He classified these models on two dimensions according to their degree of innovations

The first dimension is the degree of innovation, this ranges from what is essentially an electronic version of a traditional way of doing business, to more innovative ways e.g. by externalising via the Internet functions that previously were performed within a company or by offering functions that did not exist before. Table 1 shows the identified business models in this dimension.

Table 2.1 Internet business models (1)

<i>E-shop</i> : promotion cost reduction, additional outlet (seeking demand)
<i>E-procurement</i> : cost reduction, additional outlet (seeking suppliers)
<i>E-auction</i> : electronic bidding (no need for prior movement of goods or parties)
<i>E-mall</i> : collection of e-shops, aggregators, industry sector marketplace
<i>Third-party marketplace</i> : common marketing front end and transaction support to multiple businesses

Source: (Timmers, 1999)

*E-shops*: This is web marketing of a company and it is done to promote the company and its goods or services. Any company that creates a web site just to have a web presence can be considered to have created a very basic e-shop. Many companies adopt this model of direct sales on the Internet. The variety and number of products being sold range from one to many, and are presented in electronic catalogues or some other more innovative formats. Purchases can be made simply via fill-out forms (Hoffman and Novak, 1995; Weston, 1995). The possibility of ordering and paying is increasingly added to this very basic e-shop, often combined with traditional marketing channels. Benefits sought for the company are increased demand, a low-cost route to global presence, and cost reduction in promotion and sales. Benefits for the customer can be lower prices compared to the traditional offering, wider choice, better information and convenience in selecting, buying and delivery, including 24-hour availability.

*E-procurement*: This is electronic tendering and procurement of goods and services. Large companies or public authorities may implement some form of e-procurement on the web. Benefits sought include having a wider choice of suppliers, which is expected to lead to lower cost, better quality, improved delivery, reduced cost of procurement. Electronic negotiation and contracting and possibly collaborative work in specification can further enhance time and cost savings and convenience. For suppliers, the benefits are in more tendering opportunities, possibly on a global scale, lower cost of submitting a tender, and possibly tendering in parts that may be better suited for smaller enterprises, or collaborative tendering. The main source of income is reduction of cost (of tender processing, and getting more cost-effective offers).

*E-malls:* An electronic mall, in its basic form, consists of a collection of e-shops, usually enhanced by a common umbrella, for example a well-known brand. The mall is best suited to newcomers who desire to be part of a house of online storefronts already commanding a stream of traffic (Weston, 1995). Most e-shops rent a “shop space” from the provider and retail a variety of products. It might be enriched by a common-guaranteed payment method. When they specialise in a certain market segment, such malls become more of an industry marketplace, like Industry.net, which can add further value by virtual community features (frequently asked questions, discussion forums). The e-mall operator may not have an interest in an individual business that is being hosted. Instead, the operator may seek benefits in enhanced sales of the supporting technologies. Alternatively, benefits are sought in services (e.g. Barclays with Barclay Square), or in advertising space and/or brand reinforcement or in collective benefits for the e-shops such as increased traffic, with the expectation that visiting one shop on the e-mall will lead to visits to ‘neighbouring’ shops.

*E-auctions:* Electronic auctions on the Internet offer an electronic implementation of bidding mechanisms also known from traditional auctions. This can be accompanied by multimedia presentation of the goods. Usually they are not restricted to this single function. They may also offer integration of the bidding process with contracting, payments and delivery. The sources of income for the auction provider are in selling the technology platform, in transaction fees and in advertising. Benefits for suppliers and buyers are increased efficiency and time savings, no need for physical transport until the deal has been established, and global sourcing. Because of the lower cost, it becomes feasible to offer small quantities of low value, e.g. surplus goods for sale. Sources of income for suppliers are in reduced surplus stock, better utilisation of production capacity, and lower sales overheads.

*Third party Marketplaces:* This is an emerging model which is suitable if companies wish to leave web marketing to a third party. The third-party marketplace is often an additional, online channel to other existing channels, including physical outlets. They all have in common that they offer at least a user interface to the suppliers’ product catalogues. Several or all of the additional features, such as branding, payment, logistics, ordering and, ultimately, the full-scale implementation of secure transactions

are added to third-party marketplaces. Revenues can be generated on the basis of a one-off membership fee, service fees or a percentage of transaction values. Each shop owner can enhance the basic web site and product offer with his or her own promotions and brand enhancement. The concept accommodates the virtual as well as the physical world, for example delivery and additional services are still assumed to be happening in the physical stores. It thus strengthens local presence and geographic concentration, which can especially benefit small retailers.

The second dimension is the extent of integration of functions, ranging from single-function business models (e.g. e-shops that only provide the marketing function over the Internet) to fully integrated functionality (e.g. value-chain integration), which cannot be done at all in a traditional form, as it is critically dependent on information technology for letting information flow across networks and creates added value from integrating these information flows. See table 2 for the identified models in this dimension.

Table 2.2 Internet business models (2)

<p><i>Virtual community</i>: focuses on added value of communication between members  <i>Value-chain service provider</i>: supports part of value chain, e.g. logistics, payments  <i>Value-chain integrator</i>: adds value by integrating multiple steps of the value chain  <i>Collaboration platforms</i>: business process co-operation, e.g. collaborative design  <i>Information brokers trust providers</i>: business information and consultancy, trusted third-party services</p>
---

Source: (Timmers, 1999)

*Virtual Communities*: The ultimate value of virtual communities comes from the members (customers or partners), who add their information on to a basic environment provided by the company operating the virtual community. Membership fees as well as advertising generate revenues. A virtual community can also be an important add-on to other marketing operations in order to build customer loyalty and receive customer feedback. Virtual communities are also becoming an additional function to enhance the attractiveness and opportunities for new services of several of the other business models (e.g. e-malls, collaborative platforms, or third-party marketplaces).

*Value-chain Service Providers:* These specialise in a specific function for the value chain, such as electronic payments or logistics, with the intention of making that into their distinct competitive advantage. Banks, for example, have been positioning themselves in this way for a long time and may now find fresh opportunities using the open Internet network. New approaches are also emerging in production/stock management, where the specialised expertise needed to analyse and fine-tune production is offered by new intermediaries.

*Value-chain Integrators:* These focus on integrating multiple steps of the value chain, with potential to exploit the information flow between those steps as further added value. Revenues come from consultancy fees or possibly transaction fees. An example value chain integrator is TRANS2000 in the area of multi-modal transport (Timmers, 1999). Marshall offers its customers' added value from transaction information, which is provided through extranet solutions like PartnerNet and MarshallNet. Some of the third-party marketplace providers are moving in the direction of value-chain integration.

*Collaboration Platforms:* These provide a set of tools and an information environment for collaboration between enterprises. This can focus on specific functions, such as collaborative design and engineering, or on project support to a virtual team, for example a team of consultants. Business opportunities are in managing the platform (membership/usage fees) and in selling the specialist tools (e.g. for design, workflow, document management).

*Information Brokerage, Trust and Other Services:* A whole range of new information services are emerging, to add value to the huge amounts of data available on the open networks or coming from integrated business operations, such as information search. Search agents are software agents, which identify Web sites via keyword search through a Web-wide database (Hoffman and Novak, 1995). Examples are Yahoo, Infoseek, and Web Crawler, with additional contenders entering the market regularly. Search agent sites are useful as they help to direct potential customers to a destination web site. An effective and efficient search agent will attract many visitors, which in turn will help to generate more advertising funds. Search engines are a special category of information services, with the public Internet facility usually based on



advertising as a source of revenue. A special category is trust services, as provided by certification authorities and electronic notaries and other trusted third parties. These services charge subscription fees combined with one-off service fees, with software sales and consultancy as additional sources of revenue. Many consultancy and market research companies are now offering commercial business information services via the Internet.

In summary, this section has provided a classification of business models that are currently found in Internet electronic commerce. Some of these models are essentially an electronic re-implementation of traditional forms of doing business, such as e-shops. Many others go far beyond traditional business, such as value-chain integration, and seek innovative ways to add value through information management and a rich functionality. Creating these new business models is feasible only because of the openness and connectivity of the Internet. A consequence of the same open nature of the Internet is that it may be rather difficult to keep the details of a business model hidden.

#### **2.4 Research into business use of the Internet**

As the explosive growth and business activities on the Internet gain momentum, many reasons and strategies for business use of the Internet have been proposed and discussed in the media and the IT industry (O'Reilly, 1996). While serious work in this area is still emerging, there are an increasing number of research efforts focusing on the impact of the Internet on business use (Cronin, 1995; Ellsworth and Ellsworth, 1995, 1996); potential advantages of using the Internet (Senn, 1996; Sterne, 1995) and on small business and Internet commerce (Baker, 1994; Baker, Fuller and Jenkins, 1997; Lymer, Johnson and Baldwin-Morgan, 1997; Poon and Swatman, 1995, 1996, 1997; Poon and Strom, 1997; Bloch, Pigneur and Segev, 1996; Jeffrey and Roberts, 1997) and other studies have concentrated on various aspects of Internet usage (GVU, [http://www.cc.gatech.edu/gvu/user\\_surveys](http://www.cc.gatech.edu/gvu/user_surveys); Abell and Lim, 1996).

The Internet provides a lot of opportunities for new product diffusion, and the possibility of adapting products and service to meet local requirements and niche products (Zwass, 1996). It provides businesses with an unparalleled opportunity to reach distant markets and the potential to give almost instant access to detailed

information on the widest range of business issues. Zwass argues that the advent of cheap ubiquitous Internet technology offers companies huge potential to transact business, communicate, share and retrieve information on a global scale at a low cost.

Cronin (1995) categorises business use of the Internet into three main areas of customer relations, dealing with suppliers and internal company operations. Ellsworth and Ellsworth (1995, 1996) identified ten main business uses of the Internet including: communications (internal and external) using e-mail; corporate logistics used to achieve “real time” communications across distances; globalisation and a levelling of the corporate playing field with SMEs using the Internet to achieve more rapid internationalisation; the use of the Internet to achieve competitive advantage, for example, by creating new product opportunities; cost savings, from the use of on-line communications; on-line support of inter firm collaboration; the use of the Internet as an information search and retrieval tool and the establishment of company web sites for marketing and sales promotion.

Similarly, Butler and Peppard (1997) indicated that the Internet can be used in business for different purposes: As a medium for communicating with customers or potential customers, the interactive nature of the Internet allows companies to establish an active dialogue with customers. As a medium for information distribution and dissemination, the Internet accesses a global audience. Unlike traditional communications media, the use of voice, video, text and images provide a richer picture of company's products and services. Information can be tailored to the requirements of the consumer either by eliciting information from them or through the use of tracking technologies. As a distribution medium, the Internet enables certain products and services to be easily delivered to customers without geographical limitations, e.g. computer software, music, news and other digital-based products. Other services that can be delivered through online include training and consulting services such as Ernst & Young's on-line consulting site. It may also be possible to increase the value of a core physical product through capitalising on information. As a medium for conducting transactions, orders, invoices and other business documents can be sent electronically.

Sterne (1995) showed the potential advantages to be derived from effective Internet marketing including improved corporate image, improved customer and investor relations; finding new customers; cost reduction, market expansion; and improved communications (Hamill and Gregory, 1997). Indeed, many organisations have been quick to realise the value associated with information and the potential it holds to secure competitive advantage, which has resulted in improved financial margins, and significantly improved customer service (Chesher, 1997). Senn (1996) identified six key features of Internet that attracted businesses to participate in electronic commerce: public resource, global reach, capability to link, shared ownership, platform flexibility/diversity, and cost advantages. The modest cost of conducting business over the Internet encourages companies to adopt Internet commerce. Several other business benefits can be gained from firms' participation in electronic marketplace. The Internet allows firms to reach and interact with any potential customer or business partner anywhere in the world. This in turn helps foster a firm's presence and reputation. The wide reach of the Internet is a major influence on a firm's decisions to integrate electronic commerce into their business; such advantage is further enhanced by the flexibility and diversity of the Internet platform. Traditional channels and other non-value-adding inefficiencies are bypassed in electronic markets as the Internet enables firms to achieve direct dealings with actual and potential customers.

In addition, Senn pointed out that two factors motivate firms to use the Internet: new medium capabilities leverage for existing business and support capabilities. Senn suggested that firms should treat the Internet as a new medium to conduct business, instead of viewing Internet commerce from the traditional perspective as a supplement to current business methods. It should be treated as an innovative channel that can be used to reach out to customers, link up partners and deliver something unique. The adoption of Internet commerce helps firms to reap higher returns and create value, as they are able to maximise existing organisational resources and expertise (Senn, 1996). The medium's ability to allow consumers to easily compare shop, engage in remote applications, and provide vendors with feedback will impact a variety of factors across a number of industries. These effects may lead to an increase in product differentiation and mass customisation, and increase emphasis on individualised service (Bloch and Segev, 1996).

DTI (1998) indicates that the use of the Internet has created new opportunities both in business-to consumer and business-to business markets. These new opportunities are not restricted to the traditional sectors of information (content, IT, software and hardware and telecommunications) but completely new opportunities are emerging in fields such as electronic commerce and information services. DTI identifies three similar ways that Internet use can have a positive impact on organisational activities: (1) the use of the Internet can improve efficiency and allow processes to be streamlined by reducing the time and effort required for communicating and processing information. (2) It can improve responsiveness and shorten delivery times by enabling the transformation of business processes and by assisting in organisational change. (3) It can allow the development of new products and services, opening up new business opportunities.

#### ***2.4.1 Studies of SMEs use of the Internet***

A number of other researchers have studied different aspects of small business and Internet usage both in the UK and overseas including Poon and Swatman (1995) which discussed the opportunities the Internet makes available to SMEs, particularly in relation to the value of 'virtual alliances'. Baker (1994) was among the first to conduct research on the importance of the Internet for small businesses. Baker concluded that searching for customer information and obtaining specific information for marketing purposes were the most important benefits the Internet offered to small businesses. Fuller and Jenkins (1995) reported an experimental study on the learning and business transformation process of small business adoption. They found that the information richness of the environment in which the firm operates, the necessity of collaborating in order to compete, and the business cultures present in communicating electronically all play an important role in ongoing Internet use.

Abell and Lim (1996) carried out a survey study on the use of the Internet by small businesses in New Zealand. Poon and Strom (1997) reported on small business use of the Internet both in Australia and the UK. Quelch and Klein (1996) examined some of the wider effects of the Internet commercialisation, they argued that the Internet reduced the competitive advantages of scale economies in many industries making it easier for small companies to compete on a world wide basis. Global advertising costs, as a barrier to entry, is significantly reduced as the Internet makes it possible to

reach a global audience more cheaply. Small companies offering specialised niche products are able to find the critical mass of customers necessary to succeed through the world-wide reach of the Internet. The Internet's low cost communication permits firms with limited capital to become global marketers at an early stage in their development.

Despite variations in topic and approach all of these authors have concluded that small businesses are increasingly using the Internet and that this will radically change the way some small businesses operate. However, as Orlikowski pointed out, most of these studies have primarily focused on descriptions of Internet usage. They have failed to consider the questions of what SMEs use the Internet for and the factors influencing their decision to adopt the Internet in business.

In searching to understand the adoption and use of information technology in SMEs, more diversified studies on IT usage was discovered. These include factors affecting the adoption of an Internet based sales presence for small businesses (Auger and Gallagher, 1997), personal computing acceptance factors in small firms (Igbaria, Zinatelli, Cragg and Cavaye, 1997), determinants of success for computer usage in small business (DeLone, 1988), motivators and inhibitors for small firm computing (Cragg and King, 1993), the successful use of IT in SMEs (Naylor and Williams, 1994), the adoption of EDI in small business (Iacovou, Benbasat, and Dexter, 1995) and information technology threats and opportunities for SMEs (Blili and Raymond, 1993).

Further studies of IT usage in large organisations were discovered including measuring the extent of EDI usage in complex organisations (Massetti and Zmud, 1996), factors affecting electronic mail use (Golden, Beauclair and Sussman, 1992), a contingency model of Internet adoption in Singapore (Teo, Tan, and Buk, 1997), user acceptance of computer technology (Davis, Bagozzi and Warshaw, 1989), the influence of IT management practice on IT use in large organisations (Boynton, Zmud and Jacobs, 1994), a framework for analysing the use of the Internet for business (Vadapalli and Ramamurthy, 1997), an integrated model of adoption of the Internet in organisation (Lim et al, 1998) and adoption of case tool in organisation (Orlikowski, 1993). However, most of these studies utilise either quantitative or qualitative

methodologies. The strengths and weaknesses of each approach is discussed in chapter four, developing the argument that the use of a single methodology often fails to explore all of the issues associated with Internet adoption and usage in SMEs. The use of a mixed method approach is suggested to counteract this weakness and to enhance research into IT adoption and usage.

#### ***2.4.2 Difference between this study and past studies***

Thus, this study is similar to a number of past research studies on business use of the Internet. However, it differs from past studies in that it considers both current Internet usage and the factors that influence SMEs decision to adopt the Internet in business. Most past studies have failed to consider the factors that influence adoption of the Internet in SMEs. In fact, most of these studies have been exploratory in nature and most data has been collected via semi-structured interviews or surveys and used for descriptive purposes (Abell and Lim, 1996; Abell & Black, 1997; GVU, [http://www.cc.gatech.edu/gvu/user\\_surveys/](http://www.cc.gatech.edu/gvu/user_surveys/)) with little consideration for the factors influencing adoption and also very little theory development or testing has been reported in this area (Brancheau and Wetherbe, 1990).

The study differs from past studies in that it uses mixed methods of survey and case study to investigate Internet usage and the factors that influence SMEs to adopt the Internet in business. A number of reasons have been put forward for combining survey and case study methods for this study. The combination of these methods enable the building of a fuller, richer picture surrounding Internet adoption and use, than either method on its own would have been able. Through the use of these methods the robustness of results can be increased; findings can be strengthened through the cross-validation achieved when different kinds and sources of data converged and are found to be congruent (Jick, 1979). These methods can help find explanations for diverging results (Kaplan and Duchon, 1988; Cavaye, 1996). As Jick (1983) argued combining different methods may be used not only to examine the same phenomenon from multiple perspectives, but also to enrich understanding by allowing new or deeper dimensions to emerge. It has also been suggested (Denzin, 1989) that researchers should examine a problem from as many methodological perspectives as possible, as the flaws of one method are often the strengths of another; and by combining methods, researchers can achieve the best of each while

overcoming their unique deficiencies. This approach of combining different methods is considered necessary due to the newness and changeable nature of the area of study. This study is also unique because it uses grounded theory method to develop theory of Internet adoption in SMEs.

The study draws on the IS research tradition of interpretive case studies (Walsham, 1995), that focused on human actions and interpretations surrounding the adoption and use of the Internet in SMEs (Walsham, 1993). The reason for adopting an interpretive approach for this study, as opposed to positivist is because the author believes that the way to understand a complex phenomenon like the Internet is to adopt an approach which is concerned with understanding peoples' feelings and the real world issues. The interpretive and qualitative research methods are designed to help researchers understand people and the social and cultural contexts within which they live.

The interpretivist researcher does not enter a social setting with a priori constructs. Instead the researcher allows constructs to emerge whilst in the field learning about and trying to understand the phenomenon (Cavaye, 1996) and to interpret and make sense of the complex and dynamic nature of Internet adoption in SMEs. The study's objective fits well with the interpretivist aims of understanding phenomena from the point of view of participants directly involved with the phenomenon under study. The interpretive approach in information systems is "aimed at producing an understanding of the context of the information, and the process whereby the information system influences and is influenced by the context" (Walsham, 1993).

It has been argued (Orlikowski and Baroudi, 1991) that interpretive case study method is appropriate to generating valid interpretive knowledge, as it examines humans within their social setting. Rogers (1983) suggests that an interpretive orientation holds great promise for the study of innovation, arguing that innovation, being so uncertain and intricate, can best be understood from the point of view of the actors involved. Fichman (1992) argues that organisational adoption of technologies is simply too varied and subtle a phenomenon to be usefully studied with cross-sectional survey methods. He suggests that when studying organisational innovation, researchers should consider examining fewer organisations but in greater depth using case study or a combination of research methods.

## **2.5 Small to medium-sized enterprises (SMEs)**

The choice of SMEs as the context of this study is motivated by several considerations; the most important of which is the important role SMEs play in the economy (Iacovou, Benbasat and Dexter, 1995; Mason, 1997; DTI, 1998). As previously discussed in chapter one, SMEs are extremely important to many countries, in some countries these group of organisations provide the foundation for the entire economy (Mason, 1997). In most countries, SMEs constitute more than 98% of the total number of businesses (Poon and Swatman, 1998; Iacovou, Benbasat and Dexter, 1995; DTI, 1998; OECD, 2000a; <http://www.johnmcguinness.com/ecommerce.html>).

The establishment of an environment in the UK in which SMEs are able to grow and prosper in the emerging global business is considered critical to the development and expansion of businesses in the UK and the economy. The identification and encouragement of new business opportunities for SMEs, based on information technologies has been the priority of British government. According to DTI (1999), the UK Government's competitiveness white paper set the target of increasing the number of micro-companies and SMEs wired up to the digital marketplace (i.e. by making frequent use of Internet technologies) from 350,000 at the beginning of 1998 to one million by 2002. The DTI (1999) survey reported that SMEs in the UK have seen strong growth in the ownership and usage of ICTs. This growth is destined to continue, underpinned by the low cost of the Internet when compared to other electronic networks and its availability 24 hours a day, 7 days a week. The survey revealed that 67% of SMEs now own PCs and 44% have access to the Internet. Both web site ownership and the use of web sites to sell on-line by SMEs have more than doubled since the 1997 survey (DTI, 1999).

Information and communication technologies (ICTs) are seen as playing an increasingly important role in the growth performance of SMEs and these are taking on new significance in most countries of the world (OECD, 2000a). The advent of Internet-based electronic commerce allows smaller firms to expand their customer base, enter new product markets and rationalise their businesses. Problems of definition and measurement of electronic commerce make it difficult to gauge the size of the phenomenon. However, available data (DTI, 1998,1999; Oftel, 2000; Poon and



Strom, 1997; Abell and Lim, 1996; Abell and Black, 1997; Chappell, Feindt and Jeffcoate, 1999; Chappell and Feindt, 1999; European observatory, 1999; OECD, 2000; Poon and Swatman, 1998, 1999) indicates some growth in the rate of adoption of the Internet by SMEs in a number of countries. The majority of SMEs perceived the appropriate use of the Internet and its technology as important factors in facilitating business growth and contributing to productivity and efficiency (Behrendorff and Goldsworthy, 1996).

SMEs make up over 95% of OECD enterprises and account for 60-70% of total employment in these countries. According to the European SME observatory, 99.8% of European organisations in 1999 were SMEs, representing almost 66% of total employment and they were responsible for more than 80% of the total jobs created during the last five years (European Observatory for SMEs, 1999). Businesses in this sector include those that are flexible to new working patterns and are innovators in the adoption of new business practice. Auger and Gallagher (1997) indicate that SMEs are the largest segment of U.S., Japanese, and Western European businesses. In the US, SMEs are an important part of the economy with some 3,800,000 businesses having between 5 to 99 employees. Griffith (1993) points out that in Hong Kong, nearly 90% of companies were small, 88% of all companies employed fewer than 10 people and accounted for over 80% of Hong Kong's international trade (Griffith, 1993 cited in Behrendorff and Goldsworthy, 1996).

SMEs are key to economic growth and their potential part in creating new jobs is impressive. Although the distribution varies across countries, the bulk of employment today is found not in manufacturing but in services, where the overwhelming majority of businesses are small firms. SMEs continue to add jobs because much growth takes place in industries in which small businesses have relative advantage (OECD, 2000). In United States, for example according to recent government projections, small firm dominated sectors will provide more than 60% of new jobs in the period 1994 to 2005. In Canada, 57% of economic output is generated by an SME sector consisting of 2.2 million firms. This is because more dynamic ICT-based service sectors are dominated by smaller enterprises. In most OECD countries, this trend is linked to rationalisation in large firms, which are downsizing and outsourcing more functions to SMEs. The result is that more and more SMEs are providing business services,

including marketing, staff training, and technical testing to other services and manufacturing enterprises (OECD, 2000a).

SMEs' contribution to employment, innovation and the overall dynamism of growing service sectors underlies trends now being characterised as part of a “new economy”. They currently account for close to 100% of firms in many service activities, such as wholesale and retail trade, hotels and restaurants (OECD, 2000a). They are increasingly present in technology-intensive industries such as ICT and biotechnology and they predominate in strategic business services such as computer software and information processing or human resource development. There is evidence that SMEs are not only effective at job creation (Mason, 1997) and job replacement, they are more innovative in the development of products and process improvements and more flexible and thus more competitive in terms of the ability to produce small quantities.

Apart from the economic significance of SMEs, the sector's social significance is widely recognised. In many cases, SMEs reflect the more personal and unique characteristics of a community than larger firms do; they often serve specific market niches, the very presence of which can be a manifestation of special social and cultural characteristics. The greater independence and entrepreneurial nature of SMEs are thought to embody desirable social values and their presence is regarded as an important source of social stability (IHAC, 1997)

### ***2.5.1 SMEs' information systems capability***

Computing has transformed many organisations over the last several decades, but only since the advent of microcomputers has the impact been significant on small firms (Cragg and King, 1993). The increasing importance and proliferation of microcomputers represent a significant development in the information systems field (Davis et al. 1989; DeLone, 1988; Igarria et al, 1997). This proliferation has helped make personal computing a significant activity in SMEs (Raymond and Bergeron 1992). Igarria, Zinatelli, Cragg, and Cavaye (1997) pointed out that in 1985, only 25% of small firms were using computers and by 1990, this figure had risen to 67.5%.

Thus, despite the proliferation of microcomputers, various problems within small firms have limited the potential benefits of microcomputers. Generally, they lacked

computer knowledge, have inadequate hardware and software, need to rely on outside resources, experience lack of financial resources and technical support, have recruitment difficulties, and have a short-range management perspective imposed by a volatile competitive environment (Igbaria et al, 1997). This means that small firms face substantial risks and problems with their computerisation. Cragg and King (1993) indicate that the actual use of microcomputers in small firms appears to be limited to mainly accounting applications. They usually cannot afford to employ internal staff with specialised computer expertise. It is suggested that small firms can increase the benefits from computing and can enhance the usage of computers by increasing the number and type of applications available to them (Igbaria et al. 1997).

Much IS research has focused on large organisations and has identified several factors affecting IS success and several models of growth have been proposed (Cragg and King, 1993). However, very little is known about the adoption of computing in SMEs (Raymond, 1990), even though more and more firms have installed computers and have continued to upgrade. The adoption of IT has been established as one of the critical success factors in achieving business success (Igbaria et al, 1997). Raymond and Bergeron (1992) indicated that the adoption of IT had become a fundamental part of SMEs' plans and strategies. For this group of organisations, information technology and the direct use of information itself can be of crucial benefit, provided they can be made use of readily, cheaply and without recourse to expensive expert assistance (Poon and Swatman, 1995).

There are clearly, many factors that influence IT adoption (Adams et al, 1992; Davis et al, 1989; Davis, 1989; DeLone and McLean, 1992; Igbaria et al, 1997; Moore and Benbasat, 1991; Taylor and Todd, 1995; Thompson et al, 1991). The majority of these studies have investigated the acceptance of technology in large organisations.

Previous research has shown that there is a relationship between organisational size and computer success characteristics (DeLone, 1988). This implies that the research findings based on MIS environments in large firms cannot necessarily be generalised to small firms (DeLone, 1988; Raymond, 1985). Since small firms have distinctive and unique computing needs, as well as different technology acceptance patterns compared with large ones, there is a need to investigate the applicability of these models to SMEs. Recognising that SMEs represent a distinct group, this study extends

existing IS adoption as well as SME research by investigating Internet usage and the factors that influence adoption in SMEs. Specifically, the objective of this study is to develop an enriched model of factors that influence Internet adoption in SMEs that considers both technological, organisational and as well as environmental factors.

### ***2.5.2 SMEs characteristics***

In an increasingly global world, both information and information technology are of great significance to organisations of all sizes. It should be noted (Auger and Gallagher, 1997) that SMEs are deemed to possess specific attributes that distinguish them from the large enterprises most often studied in regards to information systems usage (Cragg and King 1993). It is argued that SMEs differ from large companies in the way they develop their corporate strategies and their technology policies. Large companies typically have well-defined processes for developing and implementing strategies through a corporate planning process. While SMEs often use less structured approaches, strategies and policies that may not be formulated but may “emerge” from a set of actions and experiments (Mason, 1997).

SMEs have fewer resources and expertise in terms of management of new technologies (Raymond et al, 1989; Blili and Raymond, 1993; Cameron and Clarke, 1996; MacGregor et al, 1998; DeLone, 1988; Igbaria, Zinatelli, Cragg, and Cavaye, 1997). They are more vulnerable because of their lack of financial and human resources (Auger and Gallagher, 1997) as well as information resources that are needed to sufficiently understand and master the organisation and its environment. Many SMEs do not possess the technological background, which would enable them to use and evaluate IT, or lack the time to explore it. Yet the need to remain flexible and innovative are the criteria for survival and success for SMEs (Poon and Swatman, 1995). On the other hand, SMEs have their own particular advantages of being more flexible and adapt to changes more readily than larger enterprises. They are often innovative in new and different ways, for example in their approach to management and marketing, rapid implementation and execution of decisions, market proximity and their capacity for adaptation and short-term orientation (Poon and Swatman, 1995). They are less likely to suffer ‘lock-in’ with respect to existing plants, technologies or organisational structure.

The problems encountered by smaller firms are different from those encountered by large firms, and require different managerial approaches (Blili and Raymond, 1993). From a strategic and administrative point of view, SMEs are mainly 'organic' in nature and can be seen as an extension of the entrepreneur's own personality. Structurally, they are typically informal with minimal differentiation among units. They are often weak in terms of financing, planning, control, training and information systems, due to a chronic lack of resources. Others may not perceive the ways in which the use of IT could enable them to operate their businesses more efficiently or cost-effectively. However, this does not necessarily mean that IT is the exclusive property of big business. It would be wrong to think that SMEs are not concerned by it, just as it would be wrong to think that they have nothing to gain from it. In fact, while some of these firms are destined to be the first victims of this new competitive tool (Mason, 1997), others by being more innovative are able to profit from the many advantages offered by technological development. Availability of new ideas and the ability to seek opportunities are essential if small businesses are to remain flexible and innovative.

Raymond et al (1989) identify several distinctive characteristics of SMEs, they argue that such firms are characterised by low levels of organisational maturity so that planning and control processes are generally less formalised. Decision-making is often the sole responsibility of the owner/manager, who because of his or her involvement in the day-to-day mechanics of the firm, has neither the time, resources nor the expertise needed to evolve an analytical approach. Time and resources are the major constraint for most small business operators (Mason, 1997). Similarly, MacGregor et al (1998) suggest that some of the following characteristics make up the organisational environment in which most SMEs operate: small management team; centralised power and control; informal and inadequate planning and control systems; lack of control over the business environment; lack of resources (limited ability to obtain finance); limited process and product technology; limited market share; heavy reliance on few customers and chaotic organisational structure. However, they added that SMEs have distinctive advantage of being responsive, flexible, flat structured, organic and simple.

Cameron and Clarke (1996) further suggested that some of the features of SMEs' made IT use ideal for their businesses. These include flexibility and their ability to change and adapt quickly to innovations compared to large organisations, which are very slow to respond to change. They are generally less formal in their organisational and managerial practices, they have less sophisticated IT capabilities and expertise than larger organisations. They tend to exhibit more informal communication and a less bureaucratic mode of operation and less rigid functional divisions. They tend to have a shorter focus on medium-term survival rather than on long-term profit, which is prevalent in large organisations. SMEs commonly have fewer resources available, both financial and intellectual (and especially managerial), to invest in major initiatives, and are dubious about the benefits of committing those resources to the painstaking planning, data gathering, reporting and analysis that larger organisations would consider essential to such undertakings.

Blili and Raymond (1993) identify similar characteristics (Raymond et al, 1989; MacGregor et al, 1998; Cameron and Clarke, 1996) of the specificity of SMEs: environmental specificity, organisational specificity, decisional specificity, psycho-sociological and information systems specificity. Some aspects of this specificity may have a particular effect on the development, introduction and use of strategic information systems. See table 2.3 for a summary of the aspects of SMEs specificity.

Table 2.3 Summary characteristics of the specificity of SMEs

<p><i>Environmental specificity</i></p> <ul style="list-style-type: none"><li>• Uncertainty: with respect to technological environment</li><li>• Vulnerability: with respect to competitive forces (customers, Suppliers, etc.)</li></ul> <p><i>Organisational specificity</i></p> <ul style="list-style-type: none"><li>• Structure mostly informal, minimal differentiation</li><li>• Resources: 'poverty' in terms of human and financial resources</li></ul> <p><i>Decisional specificity</i></p> <ul style="list-style-type: none"><li>• Strategic decision-making cycle: short-term, reactive (versus proactive)</li><li>• Decisional process: intuitive, based on experience, little use made of information and formal managerial techniques, focused on physical flows (versus information flows)</li></ul> <p><i>Psycho-sociological specificity</i></p> <ul style="list-style-type: none"><li>• Dominant role of the entrepreneur: limited information sharing, limited delegation of decision-making</li><li>• Psychological climate: favourable attitude towards information systems, but few expectations</li></ul> <p><i>Information systems specificity</i></p> <ul style="list-style-type: none"><li>• Information systems function: not very advanced stage, subordinated to the accounting function, very little expertise, experience and training in information systems management</li><li>• Information systems complexity: emphasis on administrative applications (rather than managerial), based on packaged (rather than tailored) software, little technical expertise</li><li>• Information systems success: under-utilisation of information systems, little impact on decisional and organisational effectiveness</li></ul>
--

Source: (Blili and Raymond, 1993)

*Environmental specificity:* SMEs are usually characterised by a high level of environmental uncertainty. For example, problems relating to fiscality, interest rates and legal issues have a greater impact on smaller firms than on larger ones. Their lack of knowledge and experience often means that small business is faced with a high level of uncertainty in terms of new technological environment and the eventual use of information technology for strategic or competitive purposes. Iacovou, Benbasat and Dexter (1995) examined the adoption of electronic data interchange (EDI) in small firms. Their findings indicated outside pressure from trading partners to be the main reason small companies became active in EDI.

*Organisational specificity:* SMEs are characterised by a simple, highly centralised structure. Reducing complexity can be considered as a success factor in the implementation of organisational information systems. One particular advantage of a simpler structure is that it should facilitate the tasks of needs identification and tailoring of the IS to the firm's strategy, which basically emanates from the owner-

manager(s). SMEs are often very 'poor' in terms of human, financial and material resources (Raymond et al, 1989; Blili and Raymond, 1993; Cameron and Clarke, 1996; MacGregor et al, 1998; DeLone 1988; Igbaria, Zinatelli, Cragg, and Cavaye, 1997). They usually do not have the capacity to develop and manage their own information systems, but must call on third parties (suppliers, consultants, and specialised firms), whose product and service quality may vary. This lack of control over their informational resources increases the level of risk, especially where these resources are used for both operational and strategic purposes.

*Decisional specificity:* SME's strategic decision cycle is often a short-term one, since it is focused on reaction rather than anticipation. The lack of planning in particular often provokes specific problems of IT implementation, operation and use. In addition, very few management methods and techniques such as forecasting, financial analysis and project management are employed by small business managers. The decisional process of these managers is considered to be more intuitive, based on 'guesswork' and less dependent on information and formal decision models.

*Psycho-social specificity:* In an SME, the chief executive officer (CEO) is often one, or perhaps the owner of the firm. In these firms, the CEO's viewpoint is a critical contributor to strategy and policy (DeLone, 1988). Clearly, the owner-managers play a highly dominant role in small business strategy, decision-making and organisational climate. They tend not to transmit information or delegate decision-making to their subordinates. Often, they are the only ones in the enterprise with the authority, responsibility and access to the information needed to identify opportunities for using information technology for strategic or competitive purposes. A recent study of SMEs (Mason, 1997) found that implementing technology policies in SMEs was strongly influenced by how the CEO perceived the world. Even though all the firms in the study were immersed in the same industrial setting, the CEOs differed in their view of how hostile and how dynamic their environment was. The firms' propensity to invest in new technology was strongly related to these views. The basis for decisions was not an objective reality but rather a socially constructed reality (Markus, 1994; Walsham, 1993).



*Specificity of information systems:* The IS function is usually subordinate to the accounting function, and not enough managerial expertise is available within the firm to plan, organise and direct the use of information resources. Typically, IS applications in small firms are transaction-oriented (e.g. accounts receivables) and to produce periodic operational documents and reports (Cragg and King, 1993). This type of application is usually introduced using packaged software, since many of these organisations do not have the level of technical expertise required in developing their own applications. Organisational information systems in small firms seem to be under-utilised, in most cases; information technology affects only support activities (e.g. accounting). Earlier studies (Cragg, 1984) showed that prior to the mid-1980s, accounting applications were the dominating focus of computer usage in small businesses.

DeLone (1988) found that small business typically lacked specialised knowledge and technical expertise; this shortcoming applied equally to knowledge about computers. Lack of understanding about computers is a frequently cited reason for failure of small business computer endeavours and for failure to consider computer opportunities (DeLone, 1988). Fuller and Jenkins (1995) reported that technical problems concerning connectivity and owner/operator commitment were an important, if not actually critical, factor for success. These technical problems can become potentially insuperable barriers for small businesses wishing to use IT for business activities and operations. Therefore, any analysis and planning methodology in SMEs would need to take account of the specificities identified, in particular the lack of resources and expertise in terms of computer-based information systems.

### ***2.5.3 SMEs and the Internet***

Despite the overwhelming media coverage on the Internet, relatively little is understood regarding the impact the Internet is having on firms that use this medium to facilitate commerce. Even less is understood about the impact on SMEs in the largest segment of U.S., Japanese, and Western European businesses (Auger and Gallagher, 1997). While much speculation has been offered, past empirical studies (e.g., Malone, 1985; Cragg and King, 1993; Cragg and Zinatelli, 1995; DeLone, 1988; Montazemi, 1988; Raymond, 1985; Yap, Soh and Raman, 1992) have been relatively few, often lacking in scope or methodology, and frequently contradictory in reported

findings. Most of these studies are descriptive surveys on the general use of computer applications (Malone, 1985; Cragg and King, 1993). It is important to note that the Internet is quite different from traditional computer applications in that Internet commerce is inter-organizational and supports multiple business functions (from human communication to business transactions). This makes it difficult to extend findings from previous studies in small business computer applications to Internet commerce, because these earlier studies concentrate on internal systems, which do not have an inter-organisational focus.

Fundamental changes are taking place in economies throughout the world that distinctly favours the SMEs. The downsizing and out-sourcing activity of large companies as they pursue restructuring and return to a core business has created and continues to create many opportunities for SMEs (Bloch and Segev, 1996). Pigneur (1996) argues that firm especially SMEs are confronted with a number of changes that require innovative answers. These include the emergence of a competitive global economy; the trend towards an information based economy, and the shift from mass production to a customer-driven economy. He adds that to compete in today's global information-based and customer-driven economy, SMEs must be efficient, innovative and competitive and able to respond quickly, focus on quality, and implement mass-customisation. It is suggested that in order to do this today, SMEs must be able to lever the new information and communication technologies (ICTs) to fit better into their environment, establish more co-operative inter-organisational relationships and compete on the international markets (Pigneur, 1996).

Research has shown (Lymer, Johnson and Baldwin, 1997) that many SMEs have been unable to trade electronically due to high costs associated with the Value-Added-Networks (VANs). The resulting high costs and the necessary lead times frequently create barriers to investment and widespread use of electronic commerce applications, and this inhibits the expansion of electronic commerce beyond large companies and their major trading partners (R Neches, A Neches, Postel, Tenenbaum and Frank, 1994). SMEs have generally not been very enthusiastic in their involvement with electronic commerce, and in particular with Electronic Data Interchange (Tuunainen and Saarinen, 1997). This is because SMEs have traditionally implemented and used information technologies in their business as a reactive measure in response to

requests by larger organisations who are customers and therefore provide the business imperative for them to become IT compatible (Iacovou, Benbasat, and Dexter, 1995; Behredorff and Goldworthy, 1996; Tuunainen and Saarinen, 1997; Levy and Powell, 1998; Poon and Swatman, 1998; DTI, 1998). These large companies have access to resources and investment capital, which are not generally available to SMEs. It has been argued that usually SMEs have used electronic data interchange (EDI) in a way that was originally established by their (larger companies) customers and they have not used the technology because of the opportunities it offers them or as part of their business strategy (Tuunainen and Saarinen, 1997).

A number of reasons have been given why SMEs are reluctant to implement EDI in their business: (1) because its use reduces a firm's possibilities to change suppliers due to high switching costs and (2) they need a considerable level of trust in the idea that investment of time and money will provide a payback. SMEs that have adopted EDI generally do so because of outside pressure from major customers, who provide the business imperative, rather than actively seeking the strategic benefits of EDI (Iacovou, Benbasat and Dexter, 1995; Tuunainen and Saarinen, 1997). However, the emergence of the Internet as a means of providing low cost infrastructure offers new opportunities for SMEs to introduce electronic commerce into their business activities in a low risk environment. Internet-facilitated commerce represents one of the most exciting and potentially significant emerging market opportunities available for organisations today to improve and increase productivity. Interconnections through the Internet are not constrained by the different types of computing and communications applications; hence, any business can participate irrespective of size or location. It could be argued that SMEs stand to benefit significantly from the opportunities that the Internet can offer to businesses (DTI, 1999; Auger and Gallagher, 1997).

The use of the Internet makes it an ideal platform for SMEs to trade in the global market, thanks to the flexibility of the Internet and its characteristics of non-proprietary network, low cost of accessing information and its ability to reach a global audience and the distinctive nature of SME businesses. The Internet not only provides information, albeit of a richer nature than in the traditional marketplace, but is also a mechanism for communication, an environment for conducting transactions, and

possibly a channel for actually delivering the product or service to the consumer (Angehrn 1997). It has been suggested that Internet use allows businesses to transmit and receive data in an inexpensive, simple and easy manner. It offers an open platform for exchanging information amongst all kinds of organisations as well as individuals.

The potential of the Internet as a universal infrastructure to facilitate global communication and transfer of data holds great promise for SMEs; in particular, it enables total interconnectivity between disparate systems (Bloch et al, 1996). The ability to facilitate global access to information and resources, as well as the potential to provide an efficient channel for advertising, marketing, and direct distribution of goods and information services, has led to the colossal growth and adoption of the Internet as a commercial medium (Hoffman and Novak, 1995). According to Hoffman and Novak “the Internet has the potential to radically change the way firms do business with their customers by blending together publishing and real-time communication”. A survey covering the United States, Japan, and Western Europe (IDC, 1995) revealed that SMEs make up nearly 86% of all business establishments. The Internet with its open and extendable network structure provides SMEs with an opportunity to compete on level terms with larger and more sophisticated competitors and trading partners (Abell and Black, 1997).

The primary feature of the Internet, which favours SMEs, is that the technology is based on non-proprietary technology and is distance, location and time independent. Distances and multiple time zones are no longer barriers for communicating and transacting business electronically. The flexible, open, and standard infrastructure provided by the Internet is capable of transmitting a wide variety of digital data including live audio and video (Auger and Gallagher, 1997). The Internet provides access to an on-line global marketplace, which operates on a 24-hour basis, with millions of customers and thousands of products and services. The Internet allows SMEs to implement effective globalisation strategies, which would otherwise be impossible due to the complexity of doing business in foreign countries.

It has been argued that the Internet enables new possibilities, unfeasible before, especially through its interactive nature (Chatterjee and Sambamurthy, 1999). They argue that the interactive capability of the Internet enables SMEs to provide better customer service and also to tap their existing and prospective customers for ideas to differentiate their individual products and services. It allows SMEs to establish an effective inter-business collaboration. This is particularly useful for smaller firms that normally lack the technical expertise to maintain online communication with their business partners, but are desperately in need of establishing such expertise (Hsieh and Lin, 1998). With the ability of the Internet to perform commerce anywhere at anytime, SMEs may be able to enter and participate at less cost and more efficiently in new markets.

The Internet potentially provides a unique opportunity for SMEs to efficiently expose their companies, market and sell their products and services to a wider audience than they would have been able to afford to reach using the traditional methods (Gacia-Sierra, 1996). The Internet levels the playing field, enabling just about any company irrespective of size or location to participate and compete in the global market. The levelling of playing fields provides SMEs with a number of novel and cost-effective ways to promote their goods and services on a global level. It offers benefits by opening up the global marketplace for SMEs which would normally not have the financial resources to reach potential customers or trading partners (Poon and Swatman, 1995). The Internet allows SMEs to gain increased market share and attract prospective customers in a way equal to or better than those which large companies have been able to access, but for only a fraction of *the cost* (Burgess and Cooper, 1999). The use of the Internet opens up new markets and new opportunities to otherwise geographically constrained businesses (Cameron and Clarke, 1996). It is said that the use of the Internet creates completely new marketing possibilities for small companies offering niche products to a global market (Kaufmann, 1997).

#### *2.5.3.1 Potential opportunities available to SMEs*

The discussion in this subsection draws from Bloch et al (1996), Poon and Swatman (1995) and Lymer et al (1998) to show the potential opportunities available to SMEs:

*Efficient communication:* Communication with customers for document exchange purposes can be a significant overhead for small businesses. The expense of postal and courier services varies according to business sector but is increasingly in line with the growing volume of information exchange (Poon and Swatman, 1995). The Internet provides SMEs with the ability to communicate electronically on a global basis with the same ease that larger organisations communicate internally using their internal local area networks. It also enables on-line access by SMEs to information databases and for transacting business with both customers and suppliers without any geographic restriction. It provides an electronic medium for relatively low-cost communications compared with the cost of a courier and much speedier delivery compared with postal services.

*Advertising:* Effective advertising and marketing campaigns can be expensive and require marketing experts with a profound understanding of the industry involved (Poon and Swatman, 1995). For SMEs, access to such expertise is demanding of resources and potentially unattractive. Localised marketing campaigns are effective in broadcasting the image and products of a small business, but coverage is limited and such campaigns do not necessarily reach their target audience. However, through the use of the Internet, SMEs can mount the same aggressive advertising as the big companies. The Internet provides the cheapest form of advertising relative to the number of people that it can reach. SMEs have the same potential to reach millions of people as the bigger companies. The Internet enables SMEs to develop innovative ways of advertising, delivering and supporting their product and services, thereby enhancing the company image. Existing products and services can be differentiated and new products and services can be created.

Internet technology is significantly different from other conventional print or TV/radio mediums, which are 'static' in that once created, advertisements designed for these are difficult and costly to change in any way. While advertisement on the Internet does not suffer from this limitation as changes can be incorporated into the design easily and with immediate effect.

*Access to valuable information:* Time and resources are the major constraint for most small business operators. Yet the need to remain flexible and innovative are the criteria for survival and success for SMEs. The availability of new ideas and the ability to seek opportunities are essential if small businesses are to remain flexible and innovative. The Internet can offer SMEs the opportunity to discover new markets and business possibilities. It can be a useful tool to find out about the movements and trends in a business marketplace, the actions of business competitors and partners, resources of value to the efficient operation of data intensive tasks. The sources of new ideas and opportunities are often freely accessible on the Internet with little time delay, which in turn allows them sufficient time to react to business situations and exploit such opportunities (Poon and Swatman, 1995).

*Global reach:* It is a versatile medium which has general accessibility and vast geographic reach, coupled with the ability to overcome political barriers and bureaucratic frameworks. The Internet ability to reach potential customers easily and cheaply eliminates delays between the different steps of business subprocess (IITA, 1994). It enables SMEs to 'reach' out in its presentation of their companies, products and service to a wider audience in a way that no other mechanism could allow at so little cost. This is particularly important for small businesses, which are heavily involved in business activities with clients who are geographically dispersed. A small company with a suitable product or service to sell can create as much of an impact in its own domain as a large business with a much larger budget (Burgess and Cooper, 1999). This improved reach can also be achieved for relatively little cost compared with other methods available to achieve similar results (Lymer et al, 1998).

*Low barriers to entry into new markets:* There is easier entry into new markets, especially geographically remote markets, as the playing fields become more level between companies of different sizes and locations. The low barrier to entry into new markets presents opportunities for SMEs to enter into any type of business, such as retailing, and banking, where new entrants can set up shop for a fraction of the cost of a traditional brick-and-mortar operation. All sites on the Internet are equal irrespective of company size. Big companies do not gain any edge from their presence on the Internet over their smaller counterpart; the Internet is regarded as a great equaliser, where smaller company can be larger company. With the ability of the Internet to

perform electronic commerce anywhere at anytime, SMEs may be able to enter and participate at less cost and more efficiently in new markets.

*Facilitation of existing activities:* The Internet offers opportunities for SMEs to add value to their businesses by improving the existing activities. It facilitates the current way of working by speeding up processes, reducing cost and reducing potential for errors or adding flexibility by allowing quick changes. It allows for new products to be created or existing products to be customised in innovative ways. A large source of business value from using the Internet comes from changing the products themselves, in addition to the way they are advertised, ordered or delivered. This is mainly due to the potential of collecting information, which can be used to customise products.

*Customer relationships:* The interactive nature of the Internet suits SMEs in dealing with their customers, it is especially conducive to developing customer relationships. This potential for customer interaction, which is largely asynchronous facilitates relationship marketing and customer support to a greater degree than ever possible with traditional media (Hoffman et al, 1995) and new customers can be secured in a way formerly restricted to much larger firms (Burgess and Cooper, 1999). The Internet allows SMEs far more personalised relationships between suppliers and their customers, due to their ability to collect information on customer's needs and behavioural patterns. The focus is therefore on establishing relationships with customers, based on learning their needs and desires, proposing the right products and keeping these relations active throughout. The advantage of Internet technology in learning about customers is its ability to record every event in the relationship, such as customers asking for information about a product. It can be used to transform the way SMEs deal with customers, by accumulating knowledge on their customers' detailed preferences and buying habits, targeting them with specific offers and generally dealing with them in a personalised one-to-one way.

*Customer service:* The Internet opens up a new range of possibilities for enriching interactions with customers. The ability to provide on-line answers to commonly encountered problems, email interaction on a 24-hour basis, 365 days a year, builds customer confidence and retention. One appropriate use of the web is to support customers by providing 'help desk' type facilities on-line that can be available to



customers as and when they need them. Dell Computer has succeeded in attracting customer orders and improving service by placing configuration, ordering, and technical support capabilities on the web. This use of the Internet is particularly valuable where a company has technical information to distribute or information that needs frequent updating, the most up-to-date version can always be made available on-line (Lymer et al, 1998).

*Direct marketing:* The Internet offers distribution and marketing channels for SMEs to market and sell goods to its customers. It is a cost-effective means for SMEs to market their products, services and access information relevant to their business. It offers direct sales via an electronic catalogue or some other more innovative format. Customers can order goods by filling out an electronic form on-line. It potentially offers SMEs participation in a market where distribution costs or cost-of-sale shrink to zero especially those SMEs that are in the business of publishing digital products (e.g. Software) or information services. It is about one-fourth less costly to perform direct marketing through the Internet than through conventional channels (Hoffman et al, 1995).

The advantage of the Internet as a way to deliver product information is its availability anytime and anywhere. It provides product information to customers through on-line electronic brochures and it offers an opportunity for new promotion strategies, enhancing the branding of products. However, the main problem with this type of marketing on-line is that, it is 'pale' in comparison with the real world experience of flipping through the glossy pages of hard copy catalogue or shopping in a real mall. Customers will continue to prefer the social and aesthetic delight of the 'shopping experience'. Security is another issue that hampers the acceptance of this marketing approach by customers. Another obstacle is the speed of 'surfing' the Internet, which can make on-line shopping frustrating and tedious at times.

## **2.6 Conclusion**

This chapter has discussed the Internet and small to medium-sized enterprises which formed the background to this research. It discussed the origin, growth, and commercialisation of the Internet, the increasing popularisation of the Internet, largely arising from the development of the web. The chapter has shown that the

commercialisation of the Internet is already a reality, given the widespread business presence on the Internet, indeed the bulk of recent growth in Internet usage has come from the commercial sector. The demographic of Internet users was then presented, revealing the profile of a stereotypical Internet user. The existing Internet business models and the use of the Internet in business, and the potential of the Internet to support electronic commerce and real-time services have been demonstrated, albeit on a relatively small scale.

The choice of SMEs as the context of this study was justified; the chapter discussed the importance of SMEs to the UK economy and their contribution to the private sector employment growth. The versatility and capability of Internet technology was demonstrated as an ideal platform for SMEs to participate in global markets. The literature would seem to suggest that Internet use particularly suit the type and the nature of SME business. The use of information technology in SMEs was described. The distinctive characteristics of SMEs that differentiate them from large organisations and SMEs' Internet use and the opportunities it offered them were discussed. The next chapter considers relevant literature on information systems research and discusses some of the theoretical models, which are relevant to this research.

## CHAPTER THREE

### LITERATURE REVIEW

#### Introduction

Chapter 2 discussed the Internet and small to medium-sized enterprises which formed the background to this research. Chapter 3 reviews existing conceptual models and empirical studies relevant to this study. Information systems and information technology innovations are increasingly being used to derive organizational changes intended to deliver significant performance improvement (Hammer, 1990).

Organisations both large and small need information to succeed in today's rapidly changing environment, they need to be able to process data and use information effectively when conducting their day-to-day operations (Walsham, 1993). Electronic commerce technology is enabled by the wide spread presence of information technology and the increasing use of networks, especially the Internet which have the ability to deliver cost effective on-line services for SMEs. It provides a low cost, 24-hours a day, seven days access to the global IT infrastructure (Poon and Swatman, 1995).

The innovation adoption perspective has a number of theoretical underpinnings. Of the several theoretical perspectives currently available that address IT adoption and use in organization, the most influential and useful to this study are diffusion of innovation theory (Rogers, 1983); technology acceptance model (Davis, 1989); information richness theory (Daft and Lengel, 1984); and social influence model (Fulk et al, 1990). Thus, the study sought to build on and extend these extant models and previous research on diffusion, adoption and implementation, by providing adoption model, propositions, and data designed to increase the understanding of the factors that influence the adoption and use of the Internet in SMEs.

Rogers (1983) describes diffusion of innovation as “the process by which an innovation is communicated through certain channels over time among the members of a social system”. The diffusion theory mainly focuses on innovations for individual adopters and upon rationalistic adoption decisions, it assumes that the context is

characterized by independent adoption of technologies used to perform individual tasks (Fichman, 1992). The theory identifies factors that facilitate or hinder technology adoption. These factors include characteristics of the technology, characteristics of adopters, and the means by which adopters learn about and are persuaded to adopt the technology (Rogers 1983). It is chosen here because it provides well-developed concepts and a large body of empirical results applicable to the study of Internet adoption. The theory has a more mature history and it has been broadly applied to diffusion of technologies ranging from new ideas to new machines and it has spawned considerable research in the area of technology adoption both individual and organisational. Hence it has been drawn upon to provide insight into the factors that influence Internet adoption and use in SMEs.

The technology acceptance model (TAM) provides another perspective for examining the adoption and use of the Internet in SMEs. The model describes computer usage behaviour from a set of two constructs: perceived usefulness and perceived ease of use. The goal of TAM is to provide an explanation of the determinants of computer acceptance that is general and capable of explaining user behaviour across a broad range of end-user computing technologies. Davis (1989) technology acceptance model is an adaptation of theory of reasoned action (Ajzen and Fishbein, 1980), which is specifically meant to explain computer usage behaviour. The model incorporates findings accumulated from over a decade of IS research and is well suited for modelling IS usage in organisation (Davis, 1989). Adams, Nelson, Todd (1992) suggest that the model may be used by researchers interested in understanding factors that influence the success of information systems; or it may be used in studies within and across organisations by researchers who are interested in understanding the diffusion of information technology and the determinants of technology adoption.

Information richness theory (Daft and Lengel, 1984, 1986) is arguably the most influential theory of media choice in the organisation and information sciences today, and it has inspired numerous empirical studies. Information richness theory perspective has gained wide acceptance and rapidly evolved to provide a theoretical basis for both IS research on, and decision making about, electronic communication media. One dominant view of organizational design is that the primary task confronting any organization is information processing. Proponents of this view argue

that equivocality and uncertainty must be removed from both the internal and external information environments for effective functioning to be achieved (Daft and Lengel, 1984, 1986; Daft, Lengel, and Trevino, 1987; Daft and Macintosh, 1981). The theory is interpreted as specifying a process by which managers rationally attempt to match the characteristics of the communication media at their disposal to the requirements of their communication tasks in order to achieve personal and organisational effectiveness (Markus, 1994). Although the primary focus of the information richness model is on communication (e-mail), many studies (Abell and Lim, 1996; Poon and Strom, 1997) have shown that e-mail remains the primary and most used application of the Internet. Email has important implications for organisational communication, it offers gains in both effectiveness and efficiency and it has the potential to change the nature and diversity of interpersonal interactions (Fulk, Power, and Schmitz, 1986) as well as the organisation itself (Rogers, 1986).

Information richness theory focuses on media characteristics and task requirements to “explain” the selection and use of media in organisation. It contrasts with the social influence model that places greater emphasis on contextuality and incorporates significant assumptions about social behaviour in technology adoption in organisation. The social influence model of technology use (Fulk, Schmitz, and Steinfield, 1988, 1990; Fulk, Steinfield, Schmitz, and Power, 1987; Schmitz, 1987, 1988) postulates that media perceptions and use are, in part socially constructed and the theoretical assumption of this model is based on interpretivism (Fulk, 1993). Media properties such as richness are posited to be subjective, influenced to some degree by attitudes, statements, and behaviours of others in the workplace. The theories above do not account for these social contextual influences on media use behaviour. This study is grounded in the belief that social interaction in the workplace and environment shape the creation of shared meanings and that these shared definitions provide an important basis for shared patterns of technology selection (Schmitz and Fulk, 1991). The social influence model proposes that attitudes and behaviours are partially determined by information embedded in the social context and that media characteristics and attitudes are in part socially constructed. The integration of broader social theory with media characteristic theory can provide a new perspective for explaining the adoption and use of the Internet in SMEs.

These theoretical perspectives offer differing, but overlapping, insight into the factors that influence organisations, particularly SMEs to adopt and use information technologies in general, and in particular the Internet. These perspectives sweep in crucial insights that could not have been obtained by reliance on a single perspective. And also their use widens the scope of the enquiry and pools the lessons learned from research that spans disciplines and methodologies (Wilkins, Swatman, and Castleman, 2000) and provides insights that may help to extend the depth and breadth of understanding of the adoption of the Internet in business. In addition to these theories, the study also draws from an extensive body of research in the field of information systems, IT usage, adoption innovation, implementation and technological diffusion literature. The chapter is organised in four sections. Section 3.1 discusses diffusion of innovation theory, followed by section 3.2 technology acceptance model, section 3.3 information richness theory and section 3.4 social influence model.

### **3.1 Diffusion of innovation theory**

Most past studies on adoption have used Rogers' (1983) diffusion of innovations theory to identify the attributes of innovation that influence technological adoption at individual or organisational level. As Rogers points out, innovation diffusion has emerged as one of the most multidisciplinary research topics in social sciences today, as well as studies concerned with the adoption of information technologies (Fichman, 1992). The diffusion theory offers potentially useful insights into the reasons surrounding the widespread uptake of new ideas such as the Internet in organisation (Galliers and Swan, 1999). Much of the theory was developed in the context of adopters making voluntary decisions to accept or reject an innovation based on the benefits they expect to accrue from their own independent use of the technology.

The currency of Rogers' theory of diffusion is supported by the fact that researchers continue to use his model as a basis for their own study (e.g. Chan and Swatman, 1998; Mason, 1997; Fichman, 1992; Brancheau and Wetherbe, 1990). It provides a useful perspective on challenging topics in the IT field, such as how to improve technology assessment, adoption and implementation. The theory provides well-developed concepts and a large body of empirical results applicable to the study of technology adoption and use in organisation. In his review and analysis of eighteen published empirical studies of IT adoption and diffusion, Fichman (1992) reported

that no critical review existed that focussed specifically on the application of diffusion theory to the adoption of information technologies. Fichman identified the assumptions implicit in the diffusion of innovation theory and concluded that the theory found strong support only when the context met the assumptions of diffusion theory.

Frambach (1993) found that organisational adoption of innovations has received less attention in literature than innovation adoption in individual users. Wolfe (1994) argued that most often, the adoption of innovation could not be understood without careful attention to the personal, organisational, technological and environmental contexts with which it takes place. Within the context of Internet use in SMEs, both organisational and individual level factors (the personal, organisational, technological and environmental) are undoubtedly important in understanding the factors that influence Internet adoption in SMEs. The focus of this study is on SMEs adoption of the Internet and the objective is to build and extend the diffusion theory to develop an enriched model of factors that influence Internet adoption in SMEs that considers both technological, organisational as well as environmental factors. While the diffusion theory was developed from contexts outside organisations, Rogers views it as potentially applicable within organisations.

The literature on IS innovation has investigated the effects of a wide range of variables, drawn primarily from diffusion of innovation theory (Ginzberg 1980) and technology acceptance model (Davis, 1989). In addition to these theories and their corresponding studies, much relevant empirical work has been conducted in the past few years, most notably by Bayer and Melone (1989), Markus (1987), Orlikowski (1993), Kwon and Zmud (1987), Cooper and Zmud (1990), Cragg and King (1993), Davis, Bagozzi and Warshaw (1989), Galliers and Swan (1998, 1999), Fichman (1992), Frambach (1993), Wolfe (1994), Attewell (1992), Leonard-Barton and Deschamps (1988), Poon and Swatman (1999), Robertson and Gatignou (1986), Van de Ven (1991) and Cohen and Levinthal (1990).

Furthermore, a large number of other studies have considered factors that lead to successful adoption and use of innovation in organisation. The literature on IT adoption has primarily focused on EDI (Lim, Gan and Wei, 1998), although there

have been some empirical studies (O'Callaghan, Kaufman, and Konsynski, 1992; Saunders, and Clark, 1992; Iacovou, Benbasat and Dexter, 1995; Ramamurthy and Premkumar, 1995) that have examined the factors influencing the adoption of EDI, again primarily based on research on innovation adoption/diffusion (Rogers, 1983; Tornatzky and Klein, 1982). These studies are particularly helpful in the effort to understand the factors that influence the adoption of the Internet in SMEs. However, in each of these studies, one must use caution in applying concepts derived from the large organisational context to the SME context (Mason, 1997). The remaining section describes the main elements of diffusion of innovation and presents the criticism of the theory.

### ***3.1.1 Explanation of diffusion theory***

The diffusion theory (Rogers, 1983) addresses the communication and adoption of innovations (ideas, practices, or objects “perceived as new by an individual or other unit of adoption”) through certain channels, over time, and across members of an organization. Diffusion is aimed at developing a better understanding of dissemination of new ideas through communities of potential adopters who may then make the decision to adopt the idea. The main elements of diffusion theory are innovation, communication channels, time and social systems. To understand the theory and its limitation, one needs to understand the ways in which these components relate to the diffusion of an innovation.

#### *Innovation*

Rogers (1983) defines innovation as an idea, practice, or object (Internet technology) that is perceived as new by the adopter (SMEs). Thus, an innovation can be a new idea, such as a new way of doing things, e.g. email or a new hardware technology. Newness in an innovation need not just involve new knowledge; it may not be new per se. Technological innovation like the Internet can create uncertainty in the minds of potential SMEs (e.g., about its expected consequences on the breach of security of information) as well as representing an opportunity for SMEs to reduce uncertainty in another sense (its ability to reach global audience, reduction in communication costs). The latter type of potential uncertainty reduction represents the possible efficacy of the Internet in solving an SME's felt need or perceived problems. The attributes or characteristics of an innovation as perceived by the members of a social system



(SMEs) determine its rate of adoption. The five characteristics of the innovation upon which perceptions are based include:

*Relative advantage* is the degree to which an innovation is perceived as better than the idea it supersedes. The degree of relative advantage may be measured in economic terms. Social prestige factors of convenience and satisfaction are important to adopters, although the characteristics of the potential adopters also affect which dimensions of relative advantage are most important. The economic aspects of relative advantage may however be the most important single predictor of rate of adoption. The greater the perceived relative advantage of an innovation, the more rapid its rate of adoption is going to be.

*Compatibility* is the degree to which an innovation is perceived as being consistent with the existing values, past experience, and needs of potential adopters. An idea that is not compatible with the prevalent values and norms of a social system will not be adopted as rapidly as an innovation that is compatible.

*Complexity* is the degree to which an innovation is perceived as difficult to understand and use. Any new idea may be classified on the complexity-simplicity continuum. Some innovations are readily understood by most members of a social system while others are more complicated and will be adopted more slowly. In general, new ideas that are simpler to understand will be adopted more rapidly than innovations that require the adopter to develop new skills and understandings.

*Trialability* is the degree to which an innovation may be experimented with on a limited basis. New ideas that can be tried on the instalment plan will generally be adopted more quickly than innovations that are not divisible. An innovation that is trialable represents less uncertainty to the adopter who is considering it for adoption, as it is possible to learn by doing. The ability to try an innovation out on trial or partial basis lowers the risk, and thus tends to encourage adoption

*Observability* is the degree to which the results of an innovation are visible to others. The results of some ideas are easily observed and communicated to others, whereas some innovations are difficult to describe to others. The easier it is for individuals to

see the results of an innovation, the more likely they are to adopt it. Such visibility stimulates peer discussion of a new idea, as friends and neighbours of an adopter ask him or her for an evaluation. Intangible innovations, such as new software development philosophies are difficult to observe and measure and therefore tend to be adopted more slowly than more visible innovations such as hardware.

### *Communication*

Communication is the process in which participants create and share information with one another in order to reach a mutual understanding. Information moves from a source that knows about the innovation, through one or more communication channels (e.g., mass media, such as technical journals, interpersonal or other informal channels, such as electronic bulletin boards), to an individual or organisation that does not yet have knowledge of the innovation. These communications can be enhanced when the source of the communication is similar to the target of the communication. In diffusion theory terms, this similarity between the change agent and the target of the communication is known as homophily. Homophily is the degree to which pairs of individuals who interact are similar in certain attribute, such as beliefs, education, social status, and the like. Thus, diffusion theory would predict that a transition specialist with a background similar to technical members of the organisation would be more effective in persuading technical staff to adopt a software innovation than a transition specialist who does not have this technical background. It also posits that at different stages in the innovation's life cycle, different sources, channels and targets of information may be appropriate.

### *Time*

The time dimension is involved in diffusion (1) in the innovation-decision process by which an individual passes from first knowledge of an innovation through its adoption or rejection, (2) in the innovativeness of an individual or other unit of adoption, that is the relative earliness/lateness with which an innovation is adopted – compared with other members of the system, and (3) in an innovation's rate of adoption in a system, usually measured as the number of members of the system that adopt the innovation in a given time period. Adopters are categorised in terms of their innovativeness base on the relative time at which they adopt the innovation. Adopters are assumed to be normally distributed with respect to time until adoption.

The adopters categories identified in the theory are (1) innovators, (2) early adopters, (3) early majority, (4) late majority, and (5) laggards. Associated with each adopter category are specific personality variables, socio-economic-status levels, and communication behaviours. For example, the theory characterises ‘innovators’ as possessing a higher tolerance for uncertainty about the innovation, being of higher socio-economic status, belonging to interpersonal networks that go beyond the local social system, and partaking of higher degrees of mass media exposure. The theory asserts that the ‘early adopters’, rather than the ‘innovator’, is the critical adopter category in accelerating the diffusion process. Members of the ‘early adopter’ category, more than any other, are characterised as opinion leaders because of their membership in the local social system, acceptance of local norms, and discretion in adoption of innovations. Ideally, the change agent seeks out this individual as a leverage point in accelerating the transition effort. In contrast, ‘innovators’ play a gatekeeper role in the flow of new ideas to the social systems, but are not regarded as part of it.

#### *Social system*

A social system is defined as a set of interrelated units that are engaged in joint problem solving to accomplish a common goal. The members or units of a social system may be individuals, informal groups or organisations. This sharing of a common objective binds the system together. Norms are the established behaviour patterns for the members of a social system and define a range of tolerable behaviour and serve as a guide for the members of a social system. The employing organisation is a social system that may authorise (or resist) adoption of an innovation. The rate and form of adoption will likely be influenced by the existence of opinion leaders within the various social systems, and the efforts of outside change agents interacting with the social system.

#### **3.1.2 Criticisms of diffusion theory**

The tenets of diffusion theory provide an attractive base upon which to study the adoption of Internet technology within and across organisations. However, the current expression of the theory does not adequately capture what is observed in the behaviours of organisations when they make decisions regarding the adoption of innovations.

In the diffusion literature, adoption is both conceptualised and measured as a binary occurrence – adopt or not adopt. A consumer is depicted as ‘adopting’ a home computer; a farmer ‘adopts a new type of seed corn (Bayer and Melone, 1989). In reality, it is an oversimplification to portray adoption as binary. Characterising adoption as binary does not capture instances of partial adoption, or cases in which the innovation is adopted in some form other than the one intended by developer and promoter of the innovation. For example an organisation may acquire an intelligent telephone system, but individuals within that organisation may adopt only basic telephone capabilities (Bayer and Melone, 1989).

The organisational adoption of an innovation is not typically a binary event but rather one stage in a process that unfolds over time, and the organisational decision making process, particularly in the absence of a dominant individual decision maker, frequently involves complex interactions between vested stakeholders (Fichman, 1992). Tornatzky and Klein (1982) suggest that innovation characteristics research studies should focus on both adoption and implementation as the dependent variables and not simply dichotomous yes/no adoption decisions. Modifying diffusion theory to capture non-binary adoption represents an important extension to the theory. An extension to the diffusion theory must emphasise not only partial adoption, but also the specific ‘form’ of adoption.

Many empirical studies have focused on the adoption of innovations by organisations; the distinction between individuals and organisations has not been well specified. That an organisation has acquired or authorised use of an innovation does not necessarily mean it has been adopted. Diffusion theory needs to be formally extended to map more precisely the organisational acquisition or authorisation and individual adoption.

Discontinuance, or the decision to reject a technology after it has been adopted, is not well integrated in the theory. Much of what the theory asserts about discontinuance is dependent on the adopter categories (e.g., ‘late adopters are more likely to discontinue than are early adopters’ (Rogers, 1983). They have tenuous theoretical status and weak empirical support. What is perhaps worse is that the theory fails to consider the

causes and cognitive processes underlying an individual's decision to reject a previously adopted innovation (Bayer and Melone, 1989).

Another major limitation of diffusion theory is the implicit assumption that individuals are adopting innovations for their own independent use, rather than being part of a larger community of interdependent users (Fichman, 1992). It has too often focused on innovations for individual adopters and upon a relatively rationalistic adoption decision. Rogers (1983) has pointed out that diffusion research has been suffering from a pro-innovation bias and from individual blame. The latter refers to the fact that in diffusion research individuals are held solely responsible for their action and the system which they are part of. This means that the decision either to adopt or not to adopt an innovation is attributed only to the individual and not to influences of the supplier of the innovation. Only one-third of the studies considered innovations for organisations. Yet for advanced production technologies, "decisions are often many and (reversed), and technologies are often too big and complex to be grasped by a single persons cognitive power - or usually, to be acquired or deployed within discretionary authority of any single organisational participant" (Eveland and Tornatzky, 1990).

When adoption is not a single event, and when complex organisational processes rather than individual decision-making come to the fore, the diffusion model, based on an individual's decision being primarily influenced via communication with external agents, seems less applicable. Tornatzky and Klein (1982) pointed out that future studies should emphasise such innovation, in order to increase the policy relevance of these studies to issues of organisational productivity. They suggested that the ideal study should focus on innovations in organisational (not individual) setting so that the studies would have implications for the organisational (and inter-organisational) innovation process of most public policy concern.

### **3.2 Technology acceptance model**

The previous section discussed diffusion of innovation theory that focuses innovations on individual adopters. This section presents the technology acceptance model that describes adoption behaviour from a set of two constructs: perceived usefulness and perceived ease of use. Understanding why organisations accept or reject technological

innovation has proved to be one of the most challenging issues in information systems research (Swanson, 1988). Researchers have studied IT outcomes and diffusion processes since the inception of the IS field (Gefen and Straub, 1997). A summation of the implementation literature (Swanson, 1988) highlighted independent variables such as management commitment and user involvement as influential factors in the adoption of innovations. Other studies cited factors such as job tenure, uncertainty, competition and feedback (Kwon and Zmud, 1987).

Reviews of the IT innovation diffusion literature (Rogers, 1983; Tornatzky and Klein, 1982; Davis, 1989; Prescott and Conger, 1995) which focussed on factors such as relative advantage, complexity and ease of use, examined the overall impact of these variables on adoption of technological innovation. Other researchers have studied the impact of users' internal beliefs and attitude on usage behaviour (DeSanctis 1983), and how these internal beliefs and attitudes are, in turn, influenced by various external factors, including the system's technical design characteristics (Benbasat and Dexter 1986; Benbasat, Dexter and Todd 1986) and user involvement in system development (Baroudi, Olson and Ives 1986).

Information systems researchers have suggested intention models from social psychology as a potential theoretical foundation for research on the determinants of user behaviour (Swanson 1982). Ajzen and Fishbein (1980) theory of reasoned action (TRA) is an especially well-researched intention model that has proved successful in predicting and explaining behaviour across a wide variety of domains (Davis, 1989; Davis, Bagozzi and Warshaw, 1989). TRA is very general, "designed to explain virtually any human behaviour", and is considered appropriate for studying the determinants of computer usage behaviour.

The technology acceptance model (Davis, 1989; Taylor and Todd, 1995) is an adaptation of TRA, which is typically used to explain the use of information systems in organisations. So far, little research has been undertaken to examine whether this model also holds for Internet usage in SMEs. The current study extends this work on IT implementation, adoption and diffusion by using the technology acceptance model (Davis, 1989) as the starting point in order to more completely explain the adoption and use of the Internet in SMEs' context. The remaining section explains the

technology acceptance model and discusses its limitations in providing an accurate depiction of IS usage in organisation.

### ***3.2.1 Explanation of technology acceptance model***

The technology acceptance model (TAM) (Davis, 1989; Davis et al, 1989) offers promising theoretical bases for examining the factors that influence the adoption of the Internet in SMEs. Davis (1989) technology acceptance model is an adaptation of TRA, which is specifically meant to explain computer usage behaviour. TAM is considerably less general than TRA, designed to apply only to computer usage behaviour in organisation. The model incorporates findings accumulated from over a decade of IS research and it has been especially well suited for modelling IS usage in organisations (Davis, 1989). The goal of TAM is to provide an explanation of the determinants of computer acceptance that is general and capable of explaining user behaviour across a broad range of end-user computing technologies and user populations, while at the same time being both parsimoniously and theoretically justified.

TAM posits that two particular beliefs, perceived usefulness and perceived ease of use, are of primary relevance for computer acceptance behaviours. Davis (1989) defines perceived usefulness as “the prospective users subjective probability that using a specific application system will increase his or her job performance within an organisational context”. Within organisations, people are generally reinforced for good performance by raises, promotions, bonuses, and other rewards (Davis, 1989). A system high in perceived usefulness, in turn, is one for which a user believes in the existence of a positive use-performance relationship. Perceived ease of use, in contrast, refers to “the degree to which a prospective user believes that using a particular system would be free of effort”. Effort is a finite resource that a person may allocate to the various activities for which he or she is responsible. All else being equal, Davis claims, an application perceived to be easier to use than another is more likely to be accepted by users (Davis, 1989).

TAM is an influential contribution to the enduring line of IT adoption and diffusion research. The model posits that both perceived ease of use and perceived usefulness correlates with system use, a relationship that seems to explain fairly well why

organisations accept or reject technological innovations. The causal model hypothesis that actual system use is affected by behavioural intentions, which are themselves, affected by attitudes toward use. TAM has been found to predict intentions and usage satisfactorily and it was found to be much simpler and easier to use but more powerful model of the determinants of user acceptance of computer technology (Davis et al, 1989). TAM has attracted a growing body of research, originally dealing with email and graphics (Davis, 1989). TAM has since been extended to voice-mail, word processors (Adam et al, 1992; Chin and Todd, 1995) and gender differences in the perception and use of email (Gefen and Straub, 1997), and DBMS (Szajna, 1994).

Overall, perceived usefulness and perceived ease of use have shown significant associations with outcomes (Gefen and Straub, 1997). Golden, Beauclair, and Sussman (1992) found in their study that user perceptions of the medium's usefulness affects IT use in organisation. Adams, Nelson, Todd (1992) reported that there were a wide variety of ways in which perceived usefulness and perceived ease of use could be applied. The model may be used in organisations to make selections between contending software packages. It may also be used by researchers interested in understanding factors that influence the success of information systems; or it may be used in studies within and across organisations by researchers who are interested in understanding the diffusion of information technology and the determinants of technology adoption. TAM has proven to be successful in predicting and explaining usage across a variety of systems. The theoretical insights of TAM thus provide a strong basis from which to examine factors influencing adoption in SMEs.

### ***3.2.2 Limitation of technology acceptance model***

This section discusses briefly the technology acceptance model's limitations in providing an accurate depiction of IS usage in organisation. The model was developed with the concept of a static individual computing environment in mind. As such, in today's rapidly changing IT environment, it does not provide adequate explanations of an organisation's IT usage behaviour (Kang, 1998). The model has been widely studied in IS research as an explanation of the use of information systems in organisation. However, the literature (Kang, 1998) shows that it lacks in identifying the new set of determinants of IT usage and falls short of explaining a more effective



IT acceptance behaviour in organisations. The model has failed to pursue the network effect variables related to group dynamics.

While this line of research has found significant acceptance in IS, it has ignored the effects of the social factor. Even though information system is a socio-technical field, the social factor is a fundamental aspect of organisation. The current TAM model, with its assumption of users being motivated primarily by job performance expectations from IS use, may be considered as a model of compliance (Malhotra, 1997). In this model, the users are motivated to use the IS to gain specific rewards. This delineation doesn't take into account users' intrinsic motivation (Davis 1989), although it has been suggested that users may be unwilling to use the IS even if it could improve their job performance (Malhotra, 1997).

The TAM model in its present form is not capable of explaining the IT usage behaviour of an organisation, especially when accounting for the changes in the task characteristics and its applicability in ever rapidly changing organisational environments. The model two constructs are limited to technological attributes of usefulness of computer technology and the ease of use of the technology. There are other factors to consider when organisations are adopting any technological innovation, such as the organisational characteristics (e.g. resources) and external environment (external pressure).

An alternative model is proposed in chapter 6 based on the findings from a theory-driven case study. The proposed model is expected to overcome the inadequacies of the extant model by: (a) developing a more enriched adoption model, and (b) taking into consideration not only the technological characteristics, but also the organisational as well as environmental factors of Internet usage. Within the proposed model, each of these constructs is shown as having an influence on the decision to adopt and use the Internet in SMEs. The next section discusses information richness theory, a process by which managers rationally attempt to match the characteristics of the communication media at their disposal to the requirements of their communication tasks in order to achieve organisational effectiveness.

### **3.3 Information richness theory**

The previous section discussed the technology acceptance model of adoption behaviour; this section discusses information richness theory. The discussion in this section draws from Daft and Macintosh (1981), Daft and Lengel (1984, 1986), Trevino, Lengel, and Daft (1987), Daft, Lengel, and Trevino (1987), Markus (1994) and Lee (1994). Information richness theory is arguably the most influential theory of media choice in the organisation and information sciences today. It has been influential in both IS research and practice. Many IS practitioners have used information richness theory as a basis for their decisions on which communications technologies to adopt (Ngwenyama and Lee, 1997). It has inspired numerous empirical studies because it leads directly to explicit prescriptions about how managers should use media (Lengel and Daft 1988). The core premise of the theory is that information richness is an inherent, physical property of media and that a person's use of one medium, rather than another, for a particular communication transaction is the result of a choice that the person makes in an objectively rational process. The remaining section explains information richness theory, then presents the empirical evidence supporting the theory, the criticism of the theory and the relevance of the theory to the Internet.

#### ***3.3.1 Explanation of information richness theory***

The core of information richness theory concerns the information processing requirements of tasks and capacities of media. Richness is defined as "the potential information—carrying capacity of data". If the communication of an item of data, such as a wink, provides substantial new understanding, it would be considered rich. If the datum provides little understanding, it would be low in richness. Information richness is defined as the ability of information and media to change understanding within a time interval. Communication transactions that can overcome different frames of reference or clarify ambiguous issues to change human understanding in a timely manner are considered rich (Daft and Lengel, 1984, 1986), while communications that require a long time to enable understanding or cannot overcome different perspectives are lower in richness.

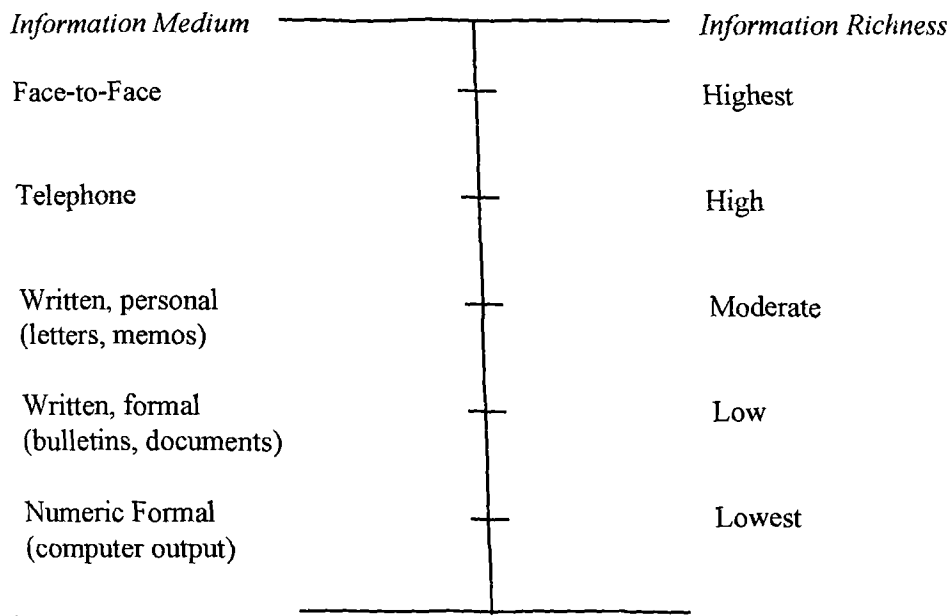
Daft and Lengel (1984, 1986) have described communication media along a single continuum of "information richness" to explain information processing behaviour in

organisations. At the core of information richness theory is the notion that what makes media more or less appropriate for particular communication tasks are inherent media characteristics (Fulk et al. 1987, Ryu and Fulk 1991). Communication media are arrayed along a continuum of “information richness” based on four criteria: "(a) facilitating feedback, (b) the ability to convey multiple cues, (c) the tailoring of messages to personal circumstances, and (d) using natural language to convey subtleties" (Daft and Lengel, 1984). The rank order of media in terms of richness is face-to-face, telephone, personal written text (letters, memos), formal written text (documents, bulletins), and formal numeric text (computer output).

Steinfeld and Fulk (1986) further added electronic mail to the richness continuum at a point between the telephone and written personal text (Steinfeld and Fulk 1986; Trevino et al, 1987). When gauged on these criteria, the richest way to communicate is face-to-face interaction: ... because it provides immediate feedback. Daft and Lengel argue that with feedback, understanding can be checked and interpretations corrected. And it allows simultaneous observation of multiple cues via body language, facial expression and tone of voice, which convey information beyond the spoken message and is of a personal nature and utilises natural language, which is high in variety (Daft and Lengel 1986).

The telephone medium is somewhat less rich than face-to-face, although its feedback capability is fast, but visual cues are not available. Therefore, individuals using the telephone have to rely on language content and audio cues to reach understanding. Written communications are less rich still, because their feedback is slow and only the information that is written down is conveyed, so visual cues are limited to that which is on paper. Formal numeric documents are lowest in the information richness continuum. Daft and Lengel argue that numeric documents tend to be useful in communicating simple, quantifiable aspects of organisations. Numbers do not have the information—carrying capacity of natural language. They provide no opportunity for visual observation, feedback, or personalization. In general, face-to-face medium is believed to convey the richest information while formal numeric documents convey the least rich information, see figures 3.1 and 3.2 respectively.

Figure 3.1 Communication Media and Information Richness



Source: (Daft and Lengel, 1984)

Figure 3.2 Characteristics of media that determine richness of information processed

Information Richness	Medium	Feedback	Channel	Source	Language
High ↑	Face-to-Face	Immediate	Visual, Audio	Personal	Body, Natural
	Telephone	Fast	Audio	Personal	Natural
	Written, Personal	Slow	Limited Visual	Personal	Natural
	Written, Formal	Very Slow	Limited Visual	Impersonal	Natural
	Low	Numeric Formal	Very Slow	Limited Visual	Impersonal

Source: (Daft and Lengel, 1984)

The information richness theory also proposes that a primary objective of organisational participants is to reduce ambiguity through media selection. Just as specific tasks vary with respect to ambiguity, specific communication media are seen to vary in their capability of reducing ambiguity. It is assumed that the communication needs of managers are different from those of operations personnel and first line supervisors. The degree of environmental uncertainty is greater for the managers than for operating personnel. The theory posits that managers choose media through a matching process, which involves assessing the requirements of the

particular communication task at hand and selecting a medium with communication capabilities that match these requirements. Efficient communication takes place when the match is perfect: the medium has neither more nor less communication capability than the task requires (Fulk, Schmitz, and Steinfield, 1990).

Managers would choose media higher in richness for those organisational tasks higher in equivocality or ambiguity than people lower down the organisational hierarchy, because the managers jobs involve greater ambiguity (Daft and Lengel, 1984).

Managers will turn to rich media when they deal with difficult, changing, unpredictable human dimensions of organisations. Rich media are needed to process information about complex organisational topics and its use facilitate equivocality reduction by enabling managers to overcome different frames of reference and by providing the capacity to process complex and subjective messages. Media low in richness are suited to simple topics, because lean media lacks adequate support for high equivocality tasks. Media of low richness processes fewer cues and restricts feedback and is less appropriate for resolving equivocal issues. Media of low richness is effective for processing well-understood management issues and standard data (Daft and Lengel 1986). Rich media more effectively reduce high levels of ambiguity and these media are considered more costly than “lean” media and are therefore deemed inefficient for tasks of low ambiguity.

In summary, Information richness theory, as originally proposed, was a prescriptive model in which achieving a match between information processing requirements (e.g., uncertainty and equivocality reduction) and communication channels (e.g., face-to-face interactions and written memos) was posited as essential for organisational effectiveness (Daft and Lengel 1984, 1986). Gradually, it came to be understood as a descriptive theory of how managers make media choices (Daft et al. 1987). The focus of the theory shifted away from the organisational context toward individual managers, their media choices, and the messages they exchange. Information richness theory provides a conceptual framework for ranking media from the richest to the leanest. In this framework, the richness of any medium and its ranking in the overall richness scale is fixed, regardless of any differences in the individuals who use it and the organisational contexts where it is used.

### 3.3.2 *Empirical evidence*

Empirical support for the theory and its application to electronic mail has been growing (Steinfeld and Fulk 1986; Trevino et al. 1990; Schmitz and Fulk 1991). In a study of media use in a large petrochemical company, Daft, Lengel and Trevino (1987) provided 95 managers with a hypothetical communication incident. The vast majority of managers reported that they would choose face-to-face for incidents high in ambiguity, but not for incidents low in ambiguity. The study also found that those managers who matched the richness of the medium to the message content, “media sensitive” managers were more likely to be rated by the organisation as high performers.

Similarly, Trevino, Lengel and Daft (1987) found support for the basic information richness proposition, although Steinfeld and Fulk (1986) and Markus (1988) found only weak support. Trevino, Daft, and Lengel (1987) presented evidence that linked rational media choice to performance ratings. Trevino, Lengel, Bodensteiner, Gerloff, and Muir (1990) found that 40 professionals in a computer centre ranked the media in the order predicted by the media richness model. They also presented 91 graduate business students with hypothetical communication incidents of varying degrees of ambiguity. The students reported that they would choose rich media for highly ambiguous messages and lean media for messages low in ambiguity. Fulk, Schmitz and Steinfeld (1990) have argued that “leaner media will be used relatively less frequently at each higher management level, because higher level jobs confront greater ambiguity”.

The evidence to date indicates that information richness theory effectively predicts some observed patterns of media use in organisations. Nevertheless, the theory falls short in its ability to account for behaviour patterns that appear non-rational on the surface (Fulk et al, 1990). Recent investigations of new information technologies cast doubt on the overarching importance of inherent media characteristics and objectively rational choice processes in predicting media use. Fulk et al (1990) argue that efficiency is not the only criterion for assessing media, a richer medium can be seen as equally useful for unambiguous tasks as for ambiguous ones. Media richness does not constrain a medium’s usefulness only to complex and difficult communication tasks. The more types of communication situations for which a medium is usable the

richer it is perceived to be in terms of speed, number of channels, type of language, and personalness, the more useful it may be seen and the more it may be used, regardless of efficiency considerations. As Markus (1988) research showed, individuals do not always make the most efficient and effective media choice using criteria of objective efficiency (Schmitz and Fulk, 1991). Rice and Shook (1990) found that media use patterns by job level were inconsistent with predictions from information richness theory.

Information richness theory suggests that, when senior managers use electronic mail, they will not use it for equivocal communication tasks, i.e. those involving: the exchange of subjective views among managers to define the problem and resolve disagreements... and the need for a shared understanding and social agreements about the correct response (Daft et al. 1987). This argument suggests that senior managers will make relatively little use of electronic mail. This is inconsistent with other empirical studies (Steinfeld, 1985; Markus, 1988, 1994; Fulk and Ryu, 1990). Markus (1988) studied media pattern use amongst 375 managers in a service company. She found that email was used for communication tasks that involved a high degree of ambiguity and was used more intensively by senior managers. Highly interpersonally involving interactions such as conflict resolution and negotiation consistently occur over electronic mail, a low social presence medium (Steinfeld, 1985; Markus, 1988, 1994).

Recent empirical studies have also identified serious conceptual and empirical weaknesses in information richness theory that calls into question the validity of the theory and its framework for managerial decision making about electronic communication media (Lee 1994; Markus 1994; Contractor and Eisenberg, 1990; Fulk, et al, 1990; El-Shinnawy and Markus, 1992; Kinney and Watson, 1992; Markus, 1991,1992; Rice, 1992; Yates and Orlikowski, 1992). As Markus (1994) has argued: "the weight of informed opinion seems to be shifting away from information richness theory in the direction of social definition theories". Other studies include reports of empirical findings in which e-mail readily supports the level of richness that information richness theory reserves for what it considers to be rich media. El-Shinnawy and Markus (1992) found no empirical support for information richness theory's prediction that individuals will prefer to communicate via v-mail than e-mail

in situations requiring the exchange of information to resolve equivocality. Instead, they found evidence to the contrary – that is, the individuals preferred e-mail (El-Shinnawy and Markus, 1992). Lee (1994) has also presented evidence of how managerial communication using e-mail was still capable of being rich, despite the fact that e-mail had all the lean media characteristics that information richness theory predicted would lead to lean communication.

Several researchers have offered alternative perspectives to information richness theory. Fulk et al (1987) propose a social information-processing model of media use in organisations in which the media choices of individuals are believed to be influenced by those of their co-workers. Markus (1994) offers the social definition theories as an alternative perspective to information richness theory. Markus writes that, in contrast to individual-level rational choice explanations of behaviour such as information richness theory, social definition theories such as structuration, social construction of technology and institutional theories, emphasise the emergent properties or social determinants of behaviour (Markus 1994).

Fulk, Schmitz, and Steinfield (1990) offer the social influence model, they target the core premise of information richness theory, which posits that information richness is an inherent physical property of media and that a person's use of one medium, rather than another, for a particular communication transaction is the result of a choice that the person makes in an objectively rational process. Fulk, Schmitz, and Steinfield propose that the properties of any medium vary from one individual to another and from one social context to another; that a person's use of one medium rather than another for a particular communication transaction is subject to not only the influence of that person's own rationality, but also the influence of group norms, the influence of other individuals, and the influence of other extra-rational factors. Likewise, Contractor and Eisenberg (1990) offer emergent network perspective; they too target the information-richness-theory premise that "each medium has an 'objective' social presence". In their "emergent perspective", they incorporate the proposition by Markus and Robey (1988) that "the uses and consequences of information technology such as communication media emerge unpredictably from complex social interactions".



Common to these alternative explanations is their rejection of the idea that communication richness is an invariant, objective property of the communication medium itself, independent of the social context where the communication takes place. On the contrary, these alternative explanations all regard communication richness or leanness not as following from the properties of the communication medium alone, but as emerging from the interactions between the people, and the organisational context (Ngwenyama and Lee, 1997).

### ***3.3.3 Relevance to the Internet***

As discussed earlier, information richness theory is interpreted as specifying a process by which managers rationally attempt to match the characteristics of the communication media at their disposal to the requirements of their communication tasks in order to achieve personal and organisational effectiveness (Markus, 1994). Appropriate selection of a medium that matches the task, leads to the most effective outcome. Yet there is little research which has attempted to link the appropriateness of media choices to measures of effectiveness, focusing instead on media selection and use (Fulk and Boyd, 1991). Information richness theory has been criticised for its over-reliance on rational processes to explain the entire range of media-choice situations. It has shown weak or mixed results in linking the richness of a chosen medium to the ambiguity or equivocality of the task (Schmitz and Fulk, 1991). Information richness theory has also been challenged for failure to take into account situational factors that might influence behaviour (Markus 1987, 1994) and social factors that might shape perceptions of media (Fulk et al. 1987).

A realistic understanding of behaviour requires knowledge not simply of objective features of the environment, but also the social milieu that alters and adjusts perceptions of that environment (Fulk, Schmitz, and Steinfield, 1990). In terms of its relevance to the Internet, although the primary focus of the information richness theory is on communication (email), many studies (Abell and Lim, 1996; Poon and Strom, 1997) have shown that e-mail remains the primary and the most used application of the Internet. Email has important implications for organisational communication, it offers gains in both effectiveness and efficiency and it has the potential to change the nature and diversity of interpersonal interactions (Fulk, Power and Schmitz, 1986) as well as the organisation itself (Rogers, 1986).

Markus (1994) presents both quantitative and qualitative evidence that she collected on the behaviours of managers, whom she observed at her field site. Markus summarises that "their actual media use behaviour was inconsistent with the information richness theory. In particular, managers, especially senior managers, used the email medium more intensively than the information richness theory predicts and in a manner that the theory regards as ineffective and hence unlikely". Managers were not primarily influenced by media richness considerations, but rather by social influences which shaped their email usage (Fulk, Schmitz and Steinfield, 1990). This finding contradicted the conventional wisdom that managers' choice of appropriate media (based on its richness) influences their performance. Markus shows that media richness theory is a poor predictor of either managers' choices or how these choices correlate with their job performance. She argues that *these contradictory results* cannot be explained by information richness theory or by simple modifications of the theory.

Furthermore, Markus observes that even though information richness theory has evolved, "it remains an individual-level rational choice theory ", in which individuals' perceptions of the objective material characteristics of media are assumed to play a key causal role. This is in contrast to social definition theories that emphasise collective, rather than individual character of media use, and the social construction, rather than the individual perception of media characteristics (Markus, 1994). She suggests that the adoption, use, and consequences of media in organisations can be powerfully shaped by social processes such as sponsorship, socialisation, and social control, which require social perspectives to understand them (Markus, 1994). This is of particular relevance to the Internet, which is viewed not only as a communication medium, but also as a useful business tool which businesses want to be associated with.

The core premise of information richness theory is that richness is an inherent, physical property of media and that a person's use of one medium, rather than another, for a particular communication transaction is the result of a choice that the person makes in an objectively rational process. The best medium or an appropriate medium for conducting a particular communication transaction would depend on more than just the features of the medium. As Lee (1994) argues, the richness of the

media is not just a property of the media itself, the Internet can best be understood by considering the social meaning of the medium for SMEs. This social meaning goes beyond the technological characteristics and features of the medium, as SMEs construct a view of the medium that is contextualised by their interpretations of the social worlds that they occupy. The same medium with the same features could readily support rich communication among some users in some organisational contexts, but only lean communication among other users in other organisational contexts. For example, some managers may prefer a more 'hands on' approach and thus would opt to communicate using face-to-face interaction, whereas others may use Internet-based communication as a means of creating 'distance' between themselves and lower-level workers, in the hope of maintaining status differences (Howcroft, 1998).

Regardless of its validity the information richness theory has had considerable influence on the area of communication research and much of that research is equally valid as regards the Internet. It holds an important place in the organisational and information sciences, the theory has stimulated and continues to stimulate empirical research on media selection and use. A substantial body of empirical research has been carried out to test its validity which has led researchers to try and revise and elaborate the theory in various ways in order to overcome some of the limitations identified (Howcroft, 1998). The next section discusses the social influence model that places greater emphasis on contextuality and incorporates significant assumptions about social behaviour in technology adoption in organisation.

### **3.4 Social influence model**

The use of information communication technologies in the conduct of business is a commonplace in organisational life today. Organisational researchers have developed theories of the social construction of such technologies. These theories propose that interactions with social agents control the technologies and their effects and that attitude toward uses of technologies converge in social systems (Contractor and Eisenberg, 1990; Fulk, Schmitz and Steinfield, 1990; Schmitz and Fulk, 1991). Literature in communication research shows that an individual's attitude, values, and behaviour are shaped in important ways by the social world in which that individual resides.

The discussion in this section draws from Fulk, Schmitz, and Steinfield (1988, 1990), Schmitz and Fulk (1991), Fulk (1993) and Fulk, Steinfield, Schmitz and Power (1987). As discussed in the previous section, information richness theory rests on some very unrealistic assumptions about human behaviour in organisations, in particular, the rationalist bias and technological determinism that pervades the approach. The theory fails to recognise a central premise of organisation theory, that behaviour occurs in a very social world, which is far from neutral in its effects (Fulk, Schmitz, and Steinfield, 1990). The remaining section describes the mechanisms of the social influence model on media use, then presents empirical evidence supporting the model and the relevance of the model to the Internet.

#### ***3.4.1 Explanation of social influence model***

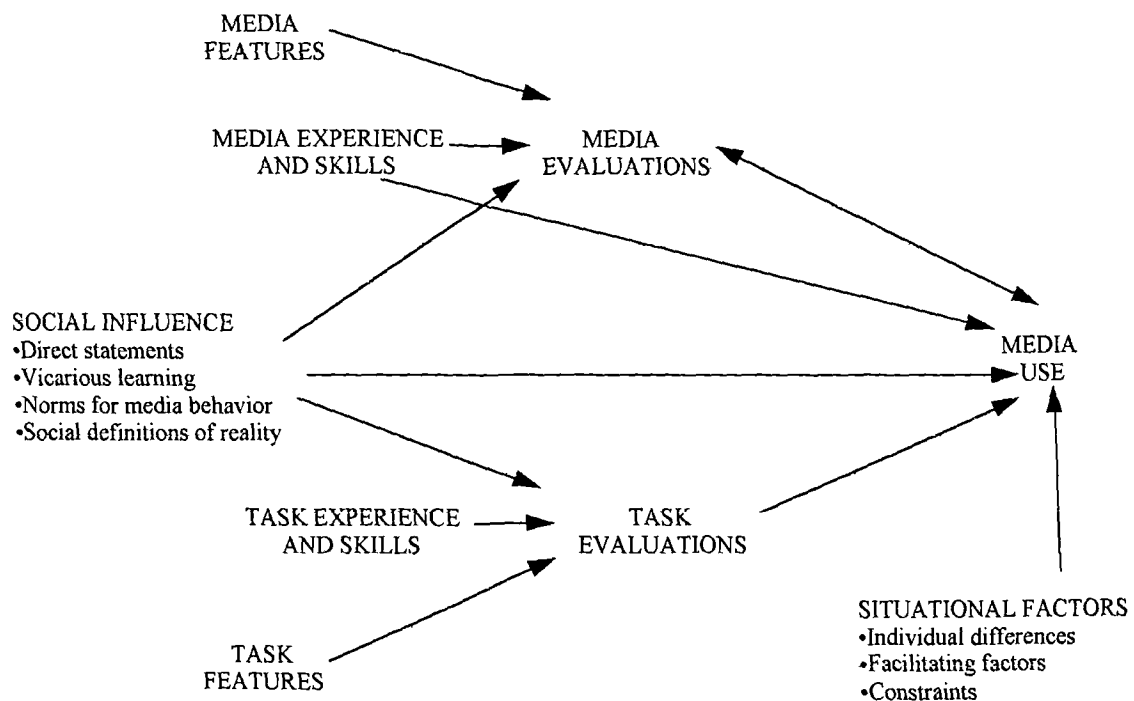
The social influence model of technology use postulates that individuals' media perceptions and use are in part, socially constructed. The theoretical assumption of this model is based on interpretivism and that cognition and behaviour can be predicted from knowledge of social and symbolic interaction (Fulk, 1993). Media properties such as richness are posited to be subjective, influenced to some degree by attitudes, statements, and behaviours of others in the workplace. The model assumes that although relatively objective features of media do influence how individuals perceive and use media, these features are but a part of an equation that determines media perceptions and use. This is in contrast to the explicitly rational information richness model which views richness as a relatively objective feature that is largely inherent in the medium. The social influence model argues that electronic media do not have fixed properties, but rather different individuals have different perceptions of the media. The advantage of the social influence model over information richness theory is its potential to explain a much wider range of media-use behaviour across a greater variety of situations. A comparison summarising the contrasting assumptions of the two approaches is provided in Table 3.1. Figure 3.3 provides a schematic diagram that indicates the pivotal role of social influence in media evaluations and behaviour.

Table 3.1 Comparison of Assumptions

	Rational Choice Models	Social Influence Mode'
Media and Task Features	<p>Fixed Objective- inherent, Physical attributes recognisable by users</p> <p>Uniformly salient a function of individuals' perceptions of media properties and task attributes</p>	<p>Variable Subjective- influenced by attitudes, statements and behaviour of others; and socially constructed</p> <p>Variably salient a function of the assessments of co-workers (including supervisors)</p>
Choice-Making	<p>Cognitive Independent Prospectively rational Objectively rational based upon a matching of media attributes with task requirements Efficiency-motivated</p>	<p>Cognitive Subject to social influence Can be retrospectively rational Subjectively rational influenced by past statements and behaviours, as well as social norms Can be efficiency-motivated but need not be</p>

Source: (Fulk, Schmitz, and Steinfield, 1990)

Figure 3.3 A Social Influence Model of Media Use



Source. (Fulk, Schmitz and Steinfield, 1990)

*Predictions for media evaluations:* The social influence model predicts that people will vary in how “rich” they perceive a particular medium to be, that this variation will not be random or idiosyncratic, rather it will be systematically linked to variation in the social context and media experience/skills.

*Predictions for media use:* Rational choice models predict similar patterns of media use across individuals in situations where their tasks are similar. By contrast, the social influence model predicts different patterns across groups, due to differences in social norms and interaction patterns, even though communication tasks and media options are comparable. The model also predicts that social norms may interfere with the acceptance of an otherwise rational and efficient new technology innovation. For example, perceptions of information security for videoconferencing, an elaborate technical arrangement can be made to provide a secure conferencing environment. However, if key individuals in the social network express concerns over information security, this fear may diffuse and decrease system use throughout the organisation. In this case, objective features of security have considerably less effect than the unfounded fears communicated in the social environment.

Information richness theory predicts that leaner media will be used relatively less frequently at each higher management level (Daft and Lengel, 1984), because higher level jobs confront greater ambiguity. The social influence model predicts less discrepancy between adjacent levels, if there is intense social interaction, such as between supervisor and subordinate. It proposes other factors influence media selection, so that lean media may be used in spite of a lack of “fit” with task ambiguity.

The role of social influence in media usage can be summarised as follows:

(1) *Social influence includes the following:*

(a) *Direct statements:* The most direct way is by overt statements about characteristics of media or tasks that individuals assimilate into their own evaluations. These direct statements also have an indirect effect of increasing the saliency of these features. By discussing particular features, co-workers increase the saliency of those features. Co-workers also voice judgements and interpretations of events that may be accepted by

the individual. The net effect is that media perceptions are not fixed and objective; instead they vary across individuals and situations.

(b) *Vicarious learning*: Social influence may take the form of vicarious learning from observing the behaviours and experiences of others. When the choices have led to positive consequences, behaviour modelling may occur. Thus, effective behaviour by one person may well be repeated by others through a process of observational learning. Similarly, choices that lead to undesirable consequences may be avoided by others.

(c) *Norms for media behaviour*: Group behavioural norms, which often have powerful effects on individual cognitions and behaviours. Social cues regarding appropriate media use may well be embedded within the norms of a particular group.

(d) *Social definitions of rationality*: Behaviour is subject to social influence in the form of widespread norms and pressure for sense making. Although sense making may be prospectively rational, it is often better described as retrospectively rational. The social environment also influences retrospective sense making. Social contexts embody requirements for “meaningful and justifiable behaviour”. They also provide “norms and expectations that constrain their rationalisation or justification of those activities” (Fulk et al, 1990).

(2) *Media experience and skills*: Medium expertise is seen to be an important precondition for use of new media, rather than a social influence factor itself. It is assumed that expertise in using new communication technologies facilitates use, whilst lack of media-related skills inhibits use; the “rich” objective features may be perceived as irrelevant if the user does not have the skill to access and use them.

(3) *Media evaluations*: in terms of perceptions and attitudes of the objective media features, media experience and skills (a), social influence (b), and prior media-use behaviour.

(4) *Task evaluations*: based on experience and skills.

(5) *Situational factors include the following:*

(a) *Individual differences:* Perceptions of computing have been found to relate to an individual's cognitive style and to individual media style. It is intended to reflect a psychological factor that predisposes individuals to select certain media over others.

(b) *Facilitating factors:* This would include such variables as accessibility of the medium, training support for new media, critical mass of users, protection of documents, reliability and flexibility of the technology, compatibility of the technology with current values, and organisational support for the medium, as well as specific hardware and software features.

(c) *Direct constraints on media use:* This includes such considerations as barriers of geography and time that prevent utilisation of certain media (Steinfeld and Fulk, 1986; Trevino et al., 1987).

#### **3.4.2 Empirical evidence**

There are some empirical supports for social influence model. Whereas information richness theory predicts that the use of new media will be relatively invariant across social units, social influence model predicts that the use of new media will vary, perhaps dramatically, across social units (Fulk et al. 1990, Yates and Orlikowski 1992). Users with more electronic mail experience and training rated electronic mail as richer than those without such experience and training. These findings are consistent with a study in a large petrochemical company, which found that a significant predictor of attitudes toward videoconferencing was an individual's perception of the opinions of co-workers and supervisors about videoconferencing. Richness perceptions vary in a non-random fashion and they are directly linked to social context and media experience factors, as predicted by the social influence model (Fulk, Schmitz and Steinfeld, 1990). A study in a large insurance firm found similar patterns of usage of voice mail among co-workers occupying the same structural network position (Shook, 1988). Rice et al (1988) also found patterns of electronic mail adoption among closely connected co-workers. Fulk, Schmitz, Ryu, and Steinfeld (1989) found that electronic mail use was predicted by the perceptions of the medium's usefulness held by communication network partners.



In the social influence model, individual differences are viewed in terms of conformity with institutionalised norms, rather than in terms of individual abilities. People who are closer, geographically and socially, to sources of legitimacy are more likely to conform than people who are distant (Markus, 1994). Thus, in a business organisation, for example, the top managers are those more likely to embody institutionalised norms of behaviour, but, again, these norms may differ from the predictions of information richness theory. Consistent with this view, Ryu and Fulk (1991) found systematic variations in the perceptions of email's richness across the workgroups in an organisation. Schmitz and Fulk (1991) argued that media evaluation was partly objective and partly socially influenced. Their study investigated the effects of perceived information richness and social influences amongst colleagues within a large research and development organisation. Their research explicitly modelled social influence factors and assessed their role in how individuals viewed and employed email. Their findings supported the view that social interaction in the workplace shapes the creation of shared meanings and that these shared definitions provided an important basis for shared patterns of media selection. Co-worker use in particular was a strong social influence, more so than supervisor use. Co-worker attitudes, in the form of perceived usefulness of email, affected email richness and also had an indirect effect on its use. The study demonstrated that an explicit consideration of social influence aids understanding of how individuals perceive and use new information technology.

### ***3.4.3 Relevance to the Internet***

The social influence model focuses primarily on relationships within organisations, and explains patterns found in today's organisations. It takes into account the social context of behaviour, a factor known by organisational theorists to be an integral part of organisational behaviour. The SI model argues that electronic media do not have fixed properties, but rather different individuals have different perceptions of the media. The model assumes that although relatively objective features of media do influence how individuals perceive and use media, these features are but a part of an equation that determines media perceptions and use. The perceptions of objective features such as an ability to provide a permanent record and asynchronicity (Culnan and Markus, 1987) may differ across individuals and the media, and task features are variably salient to individuals and are also determined to a substantial degree by the

attitudes, statements, and environmental context. A person's use of one medium rather than another for a particular communication transaction is subject not only to the influence of that person's own rationality, but also the influence of group norms, the influence of other individuals, and the influence of other extra-rational factors.

Fulk, Steinfield, Schmitz, and Power (1987; Steinfield, 1986) propose a theory of social information processing as a predictor of user attitudes toward IT and motivation for use. The theory is based on social interactionist roots and addresses the impact of users subjective view of the external environment on medium use. Elements of SMEs environment and the perceptions of that environment will affect how SMEs adopt and use the Internet. Although their theory appears similar to Daft et al's (1987) symbolic interactionist perspective, Fulk et al (1987) view properties of the media as subjective, not objective, and believe users' perceptions of the environment and media choice is seen as socially rather than rationally determined.

The facilitating factors identified in SI model earlier, which influence media usage, will differ to some extent, in the adoption and use of the Internet. The most notable difference being that the influence of colleagues within the organisation will be supplemented by the additional influence of SMEs perception of their environmental context (for example, the pressure from trading partners and competitive pressures). Whilst the social influence model is a notable advance from the more rationalistic views of communication media in organisations, it feeds into the much broader question of the relationship between the social and the technical and the ways in which these two elements are viewed as disparate. Howcroft (1998) argues that it is perhaps more appropriate to view the Internet in terms of the rich interplay of both the social and technical factors as opposed to focusing primarily on one aspect, often to the detriment of the other.

### **3.5 Conclusion**

In this chapter various theoretical frameworks have been described and their relevance to the study discussed. The chapter began by discussing the diffusion of innovation, the technology acceptance model, information richness theory and social influence model, which has been characterised by largely positivist epistemology. However, they were found to be relevant to the adoption and use of the Internet in SMEs. Some

of the empirical support for the theories has consisted of laboratory type experiments, often the subjects were students, whose behaviour in this type of formal setting would probably differ quite radically from that of people carrying out everyday tasks in a real world organisation (Howcroft, 1998). A large body of the research discussed focused on the technical advantages and task requirements to explain the adoption and use of technology in organisation (Schmitz and Fulk, 1990). There has been an overriding theme with most of the research in that it attempts to match media characteristics and task characteristics. These models are based on the assumption that each medium has an "objective" set of features, which can be replicated in any organisational setting, regardless of the particular context. In the next chapter consideration is given to the selection of the appropriate research methodology.

## CHAPTER FOUR

### RESEARCH PROCESS

#### Introduction

Chapter 3 reviewed literature relevant to the study. Chapter 4 evaluates research approaches and describes the methodology used to provide data to investigate them; it aims to provide assurance that appropriate procedures were followed. The chapter is organised as follows: first, the philosophical assumptions of positivism and interpretivism are examined. Second, research approaches are reviewed and a framework for guidance on how to choose research methods is presented. The framework considers the appropriate selection of methods primarily based on Galliers' (1992) taxonomy of research approaches in information systems. The intention of using Galliers framework is to provide guidance to the researcher on how to choose the appropriate and well-justified research strategy, which is consistent with the aims and objectives of the study. Third, the research method chosen for this study is presented, limitation of research method and the justification for choosing a mixed methodology approach is given. Four, the research design and the data sources to show how they contributed to the achievement of the research objectives, and the steps used in conducting the empirical work is explained, and the grounded theory procedures for analysing data is described.

#### 4.1 Philosophical assumptions of positivism and interpretivism

This section overviews the underlying theoretical assumptions of *the two main* research philosophies that have been used to conduct research in information systems. This overview is relevant because a description of these two dominant research perspectives will help to clarify how they differ from each other. Since detailed expositions of positivism and interpretivism already appear in the IS literature (Lee 1991; Mumford et al. 1985; Nissen et al, 1991; Orlikowski and Baroudi, 1991; Myers, 1997; Galliers, 1992) and research methods (Lincoln and Guba, 1985; Leedy, 1993), the discussion here will be very brief to gain insights into the different philosophies and assumptions that could ground the methodology for the conduct of this research.

The positivist paradigm remains the dominant approach in conducting research in information systems field (Kaplan and Duchon, 1988; Orlikowski and Baroudi, 1991; Walsham, 1995). However, the interpretive perspective has been increasing and gaining more credibility and wider acceptance in information systems research (Myers, 1997; Klein and Myers, 1999; Walsham, 1995). The reasons for the growth of interpretive research include a general shift in IS research away from technological to managerial and organisational issues (Myers, 1997; Hirschheim, 1992; Benbasat, Goldstein, and Mead, 1987) and a desire to study problems in the richness of their real-life setting as contrasted with the artificial context of laboratory studies. Prominent among the variety of interpretive research strategies which have been suggested in the research literature are interpretive in-depth case studies (Walsham, 1993, 1995), grounded theory (Glaser and Strauss, 1967), ethnography (Harvey and Myers, 1995), phenomenology (Boland, 1985), hermeneutics (Lee, 1994), and critical hermeneutics (Myers, 1994, 1995).

Both positivist and interpretivist perspectives aim to provide greater understanding of given phenomena. However, the approaches differ greatly in terms of how this can be achieved. The positivist and interpretivist approaches need, therefore, not be viewed as irreconcilable and can be accepted as providing different views of the same phenomenon. Researchers can combine interpretive research in one study to support positive research in another, or vice versa. Positivist and interpretivist methods can also be present simultaneously and mutually supportive within one study (Kaplan and Duchon, 1988). In her study of electronic mail as the medium of managerial choice, Markus (1994) mixes positivism (survey: involving hypothesis testing) and interpretivism (case study) to examine what some managers themselves meant in the e-mail messages they sent to one another. The philosophical base of these two perspectives is summarised in table 4.1.

Table 4.1 Difference between positivist and interpretivist epistemology

Epistemological assumptions of positivism	Epistemological assumptions of interpretivism
1. Experience is taken to be objective, testable and independent of theoretical explanation	1. Data are not detachable from theory, for what counts as data is determined in the light of some theoretical interpretation, and facts themselves have to be reconstructed in the light of interpretation
2. Theories are held to be artificial construction or models, yielding explanation in the sense of a logic of hypothetico-deduction (if T is true, phenomenon x follows)	2. In human science theories are mimetic reconstructions of the facts themselves, and the criterion of a good theory is understanding of meanings and intentions rather than deductive explanation.
3. Law-like relations (generalisations) are derived from experience and are independent of the investigator, his/her methods and the object of study	3. The generalisations derived from experience are dependent upon the researcher, his/her methods and the interactions with the subjects of study. The validity of the generalisations does not depend upon statistical inference 'but on the plausibility and cogency of the logical reasoning used in describing the results from the cases, and in drawing conclusions from them' (Walsham, 1993).
4. The language of science can be exact, formalisable and literal	4. The languages of the human sciences are irreducibly equivocal (because of multiple, emergent meanings) and continually adapt themselves to changing circumstances
5. Meanings are separate from facts	5. Meanings in the human sciences are what facts constitute the facts, for data consist of documents, intentional behaviour, social rules, human artefacts, etc., and these are inseparable from their meanings for agents

Source: (Myers, 1997)

#### 4.1.1 Positivist perspective

IS research can be classified as positivist if there is evidence of formal propositions, quantifiable measures of variables, hypothesis testing, and the drawing of inferences about a phenomenon from a representative sample to a stated population (Orlikowski and Baroudi, 1991). Examples of a positivist approach to qualitative research include Yin's (1994) and Benbasat et al.'s (1987) work on case study. Positivist studies are concerned in testing theory, in an attempt to increase the predictive understanding of phenomena. The approach is based on 'rational' positivist thought, this includes the presumption that there is a 'real world', that exists independently of human existence or perception of it, that observation of the phenomena under investigation can be made objectively and rigorously, that events in this world are determined by natural laws, that insights arise from discovering these natural laws. Positivist researchers

tend to ignore the fact that people think and act, that people are active makers of their physical and social reality. Sample surveys and controlled experiments are the primary data collection techniques, and inferential statistics is the data analysis method used to 'discover' causal laws. The validity and reliability of identifying and measuring instruments are crucial, as are researcher detachment from the research process, random assignment of subjects and control over confounding influences (Orlikowski and Baroudi, 1991).

#### ***4.1.2 Interpretive perspective***

A fundamental distinction between the interpretive and positivist worldview is the interpretive primary presumption of social constructivism. The underlying premise of the interpretive researcher is that "individuals act towards things on the basis of the meanings that things have for them, that meanings arise out of social interaction, and that meaning are developed and modified through an interpretive process" (Boland, 1979; Orlikowski and Baroudi, 1991). The interpretive philosophy, asserts that the positivist assumptions are unwarranted, that facts and truth are 'chimera', that objective observation is impossible, and that the act of observation and interpretation is dependent on the perspective adopted by the observer (Clarke, 1994).

Interpretive approaches do not assume an objective reality that can be discovered and replicated by others. Rather, the approach is based on an ontology in which reality is subjective, a social product constructed and interpreted by humans as social actors according to their beliefs and value systems (Darke et al, 1998). Interpretivism asserts that reality, as well as our knowledge thereof, are social products and hence incapable of being understood independent of the social actors (including researchers) that construct and make sense of that reality. The world is not conceived of as a fixed constitution of objects, but rather as "an emergent social process as an extension of human consciousness and subjective experience" (Burrell and Morgan, 1979).

Interpretivist research rejects the notion of value-free research and is not concerned with the repeatability of an explanation. The value of explanation is judged in terms of the extent to which it allows others to understand the phenomena and makes sense to those being studied (Walsham, 1995). The approach is usually concerned with deep understanding of the 'real world' issues through accessing the meanings that

participants assign to them and focuses on their cultural and historical context (Orlikowski and Baroudi, 1991). It contends that theories and concepts tend to arise from the enquiry (Robson, 1993) and it does not predefine dependent and independent variables, but focuses on the complexity of humans' sense making as the situation emerges (Kaplan and Maxwell, 1994).

Interpretivists argue that organisations are not static and the relationships between people, organisations and technology are not fixed but constantly changing. It assumes that the social world is not 'given', rather, the social world is produced and reinforced by humans through their action and interaction, that organisations, groups, social systems do not exist apart from humans, and hence cannot be apprehended, characterised, and measured in some objective or universal way (Orlikowski and Baroudi, 1991). According to Walsham (1993), interpretive research approach in information systems is "aimed at producing an understanding of the context of the information, and the process whereby the information system influences and is influenced by the context" (Walsham, 1993). The interpretivist researcher attempts to gain deep understanding of the phenomena being investigated, and acknowledges his or her own subjectivity as part of the process. It allows participants to use their own words and images, and to draw on their own concepts and experiences.

Based upon the interpretive assumptions and given the focus of this study is concerned with the adoption of the Internet in a complex social context, the general characteristics of interpretivism become evident as the most appropriate perspective to use in this study. Therefore, the *choice of taking an interpretivist position* for this study, as opposed to positivist is because the author believes that the best way to understand a complex phenomenon like the Internet is to adopt an approach which is concerned with understanding the experiences of the participants involved. The primary aim of this study is to describe, interpret, analyse, and understand Internet adoption and usage from SMEs' perspective. And also given that the Internet adoption in SMEs is a dynamic and social phenomenon, it therefore requires an appropriate approach to help the researcher to understand the complex interactions within the natural setting.



The interpretive perspective is designed to help researchers understand people and the social and cultural contexts within which they live. According to Klein and Myers (1999) the interpretive approach can use research methods such as ethnography, case study and grounded theory, all of which give explicit recognition to the world of consciousness and humanly created meanings. The researcher agrees with Burrell and Morgan (1979) that reality is socially constructed, the researcher avoids imposing externally defined categories on the study, instead all the categories emerged and were grounded in the data (Strauss and Corbin, 1998). The categories and themes that emerged out of this study were closely coupled to those relevant to the study's participants. Furthermore, the author agrees with the criticisms against scientific approaches regarding the objectivity of observations and impartiality of the researcher. However, the positivist approaches are still invaluable in generating data about situations. The difference lies in the analysis of the data. Instead of relying on quantitative analysis, the researcher used grounded theory approach for interpreting the situation and building theory.

## **4.2 Research approaches**

The choice of research design must be appropriate to the phenomenon under investigation (Patton, 1987). Thus, the nature of Internet usage and the factors that influence SMEs adoption of the Internet will have implications for the choice of suitable methodology. Literature survey shows that existing work has tended to favour quantitative methodologies ([http://www.cc.gatech.edu/gvu/user\\_surveys](http://www.cc.gatech.edu/gvu/user_surveys); Abell and Lim, 1996). By contrast, qualitative research on Internet usage is extremely rare (Orlikowski, 1993; Poon and Swatman, 1998). Although some investigations do show elements of combining qualitative and quantitative methods (Markus, 1994; Gable, 1994; Kaplan and Duchon, 1988), few, if any, existing studies of Internet usage use the mixed methods approach as an explicit research strategy. This study argues that such an approach is a worthwhile means of gaining a fuller understanding of the factors that influence SMEs decision to adopt and use the Internet.

### **4.2.1 Quantitative research**

Quantitative research designs are characterised by the assumption that human behaviour can be explained by what may be termed "social facts", which can be investigated by methodologies that utilise "the deductive logic of the natural sciences"

(Jones, 1997). Quantitative investigations look for "distinguishing characteristics, elemental properties and empirical boundaries" and tend to measure "how much", or "how often" (Nau, 1995). A quantitative research design allows flexibility in the treatment of data, in terms of comparative analyses, statistical analyses, and repeatability of data collection in order to verify reliability. Although the approach is obviously useful in determining the extent of such behaviour or attitudes, the methodology adopted fails to provide any explanation or analysis beyond the descriptive level.

Jayarathne (1993) suggests some advantages of a quantitative research design, noting that as well as producing what may be considered more objective data it may also allow more objective analysis. Thus, it can be seen that quantitative methodologies do have strengths for IS research. These may be summarised as follows: Quantitative methodologies are appropriate to measure overt behaviour; they are strong in measuring descriptive aspects; quantitative methodologies allow comparison and replication; reliability and validity in quantitative methodologies may be determined more objectively than qualitative techniques.

These strengths however, are not the sole prerogative of quantitative designs. Indeed, many of the arguments for the use of quantitative research, especially in an academic climate where resources are limited, have pragmatic origins in terms of allowing large scale data collection easily and cheaply in a variety of settings, and analysis at reasonable cost and effort, as well as providing statistical 'proof'. The weaknesses of such quantitative research designs lie mainly in their failure to ascertain deeper underlying meanings and explanations of the phenomenon under investigation, even when significant, reliable and valid.

The quantitative assumption regarding usage is that Internet uses can be reduced to a set of variables, which are somehow equivalent across SMEs and across situations. Quantitative research is strong in measuring such variables and, if this measurement is the focus of the research, then a quantitative approach may be justified. However, attitudes are important to the adoption of the Internet in organisation. Although quantitative methods can be used to measure such factors, their appropriateness in explaining them in depth is more limited. A further weakness of quantitative

approaches lies in their tendencies to take a "snapshot" of a situation, that is to measure variables at a specific moment in time.

#### **4.2.2 Qualitative research**

Qualitative research designs are those that are associated with interpretative approaches from the informants', rather than measuring discrete, observable behaviour. Qualitative research is used to answer questions about the nature of phenomena with the purpose of describing and understanding the phenomena from the informant's point-of-view (Leedy, 1997). Qualitative methodologies are strong in those areas that have been identified as potential weaknesses within the quantitative approach, e.g. the use of interviews and observations to provide a deep, rather than broad, set of knowledge about a particular phenomenon, and the appropriateness of investigating the attitudes of the SMEs towards Internet adoption and use. This allows the researcher to achieve an in-depth understanding of the phenomenon.

The argument used here is that quantitative methods measure human behaviour "from outside", without accessing the meanings that individuals give to their measurable behaviour. If, as many authors have suggested (Galliers, 1992; Hirschheim, 1992; Orlikowski and Baroudi, 1991) that IS field is technical as well as social, then the emphasis should rather be upon gaining an understanding of how the informants themselves view their own particular situations. A qualitative research design allows these understandings to be investigated from the informants' point of view. The advantages of a qualitative methodology for the phenomenon under investigation can be summarised as follows:

Qualitative methodologies allow the phenomenon to be explored in greater depth than quantitative methodologies; qualitative methodologies encourage the informant to introduce concepts of importance rather than adhering to subject areas that have been pre-determined by the researcher. As noted earlier, research into IT usage and adoption are rare, and thus the flexibility of qualitative methodologies is appropriate for research that may be exploratory in nature. Qualitative approaches permit the identification of longitudinal changes in IT usage, whereas quantitative approaches tend to take a 'snapshot' of behaviour, cognition or affect at the one time the research is conducted.

Objections to the approach do exist. However, the main argument against is the concept of validity, in that it is difficult to determine the truthfulness of findings. The relatively low sample numbers often encountered may also lead to claims of findings being unrepresentative of the population. The choice of case may lead to criticisms of the case being untypical. As will be argued within this chapter, the use of a mixed methods approach may enable the researcher to avoid such potential criticisms. The objectivity of quantitative research is apparently "synonymous with good research" and the inherent lack of objectivity within qualitative research is synonymous with "sloppy" (Maykut and Morehouse, 1994) and "unscientific" research (Nau, 1995). Whilst not arguing for a hierarchy of research methods, this study suggests that a third way, the mixed methodology approach which is discussed later in the chapter, provides even greater strengths to the researcher, and may enhance both the quality and perception by others of the research. The next section presents a framework that can guide a researcher into choosing appropriate research methods in information systems.

#### ***4.2.3 Taxonomy of research approaches***

Galliers (1992) proposes a framework which can be used to identify appropriate research methods in information systems, he stresses that the framework should be used as a guide and to stimulate thinking and not prescriptively to identify the 'right' method. The purpose of presenting the taxonomy is to propose a starting point for the selection and rejection of methods. The framework provided in figure 4.1 is used in this study as a guideline rather than as dogma.

Figure 4. 1 Information systems research approaches

Object	Mode for traditional empirical approaches (observations)					Modes for newer approaches (interpretations)				
	Theorem Proof	Laboratory experiment	Field experiment	Case study	Survey	Forecasting and futures research	Simulation and game/role playing	Subjective/argumentative	Descriptive interpretive (including reviews)	Action research
Society	No	No	Possibly	Possibly	Yes	Yes	Possibly	Yes	Yes	Possibly
Organisation/ group	No	Possibly (small groups)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individuals	No	Yes	Yes	Possibly	Possibly	Possibly	Yes	Yes	Yes	Possibly
Technology	Yes	Yes	Yes	No	Possibly	Yes	Yes	Possibly	Possibly	No
Methodology	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Theory building	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Theory testing	Yes	Yes	Yes	Yes	Possibly	No	Possibly	No	Possibly	Yes
Theory extension	Possibly	Possibly	Possibly	Possibly	Possibly	No	No	No	Possibly	Possibly

Source: (Galliers, 1992)

Galliers classifies the information systems research approaches into two main categories: as shown in figure 4.1. (1) Scientific: traditional empirical approach based on 'rational' positivist thought, which assumes that observations of phenomena under investigation can be made objectively and rigorously. (2) Interpretive: newer approach based on subjective interpretations, interpretivist argues that the scientific ethos is misplaced in social scientific enquiry because of: the possibility of many different interpretations of social phenomena; the impact of the social scientist on the social systems being studied; the problems associated with forecasting future events concerned with human ... activity given the fact that there will always be a mixture of intended and unintended effects and ... the danger of self-fulfilling prophecies or the opposite (Galliers, 1992).

The taxonomy discusses the likely suitability of each approach in the context of the research topic under investigation. It shows some of the potential research methodologies that can be used in carrying out research in information systems include laboratory and field experiments, forecasting/futures research and simulation and game/role playing, surveys, case studies, action research and observation. Some of these research methodologies identified in the framework are briefly discussed below.

*Laboratory and field experiments* allow the researcher to isolate and control a small number of variables, which may then be studied intensively. These methods assume that real-world interference is not important to the events being studied. The complex situations in which factors influencing the adoption of the Internet is interpreted, questions the validity of attempting (1) to isolate change within an experimental situation because this assumes a simplified snapshot view with a clear beginning and an ending (Pettigrew, 1985; Vitalari, 1985). (2) To develop an explanation based on models of abstracted causality (Galliers and Land, 1987). Moreover, because the context of each situation varies with each case, the researcher cannot predict exactly how the participants will interpret the factors that influence their decision to adopt and use the Internet. This makes it impossible to set up controlled experiments since the researcher cannot know in advance which variables to control, manipulate or to exclude (Baskerville and Wood-Harper, 1992). Therefore, laboratory and field

experiments are deemed inappropriate for this study as the variables regarding Internet adoption and usage are not presupposed and identified.

*Forecasting/futures research, and simulation and game role playing* has the potential of providing insights into future occurrences, and simulations and game/role playing have the advantage of studying situations that might otherwise be impossible to analyse. However, limitations regarding futures research include self-fulfilling prophecies and the unpredictability of environmental factors, for epistemological reasons similar to those applying to experimental approaches. Forecasting/future approach is considered less appropriate because this study is not concerned with future use of the Internet; its focus is on how the Internet is being used now in business. This also applies to simulation and game/role playing, which have an additional limitation insofar as they are not based in real life interventions. The objective of the study is not to extrapolate events, rather the research objective is to describe and understand Internet usage in SMEs now, not in the future.

*Action research* recognises that the researcher cannot be separated from social debate and so attempts to make their biases explicit and to record failed as well as successful interventions (Lyytinen and Klein, 1985). Action research entails not just observing and recording but actively taking part in attempts to solve problems on site i.e., the researcher is actually intervening in a situation. The approach is not considered suitable for this study because the researcher is not seeking to intervene in a research context to achieve a particular outcome. The purpose of the study is not to intervene or correct any action; rather the focus is one of understanding and making sense of how the social actors use the phenomenon under investigation.

*Observation*, whether passive or participant, is deemed unsuitable for the study because to observe SMEs using the Internet will provide little insight into how the participants use the Internet and the factors that influence them to use it. This study is more concerned with 'sense making' of each interaction in the SMEs' business. Therefore, to observe the SMEs using the Internet would only provide information concerning 'human computer' and the Internet (Howcroft, 1998), and that is not the focus of this study.

The Galliers' framework attempts to provide an indication of the likely appropriateness of various IS research methods in the context of the focus of the research effort. As can be seen, it is precisely the positivist approaches that appear to have most utility in terms of undertaking research with respect to the management and utilisation of IT in organisations. If one accepts the arguments of Galliers' framework, however, one might call into question the appropriateness of some of those research methods in IS research, such as the forecasting and futures, simulation and game and role playing which are included and classified as interpretive. Most of these newer approaches are rarely mentioned in information systems literatures and examples are rarely shown on how to use them to conduct research in IS.

Case study is classified in Galliers framework in the traditional empirical approach. However, the researcher argues that this method should be classified in both traditional and newer approaches, because its underlying philosophy also fits well with interpretivism. Cavaye (1996) notes that in spite of the dominance of the positivist style of case study, there is a noticeable increase in the use of interpretive case study research on IS issues, and papers discussing the interpretive case study research approaches are beginning to appear in major IS journals (Walsham, 1995; Klein and Myers, 1999). Cavaye argues that case study is a versatile and pluralistic research method that can be applied in many different ways to suit the objective of the phenomenon under investigation. The case study method can be carried out taking a "positivist stance (Yin, 1994; Benbasat et al., 1987) or an interpretivist stance (Walsham, 1993; Myers, 1997), it can take a deductive or an inductive approach, it can use qualitative and quantitative approaches and can investigate one or multiple cases (Cavaye, 1996).

#### **4.3 Research method chosen for this study**

The study takes the form of exploratory and descriptive research, focusing on the usage and adoption of the Internet in SMEs. A thorough examination of Galliers (1992) framework was undertaken and careful consideration given to the research methods and their purpose, strengths, weaknesses and their ability to meet the objectives of this study. Given the newness and changeable nature of the area of study, the research questions were best pursued in the context of a mixed

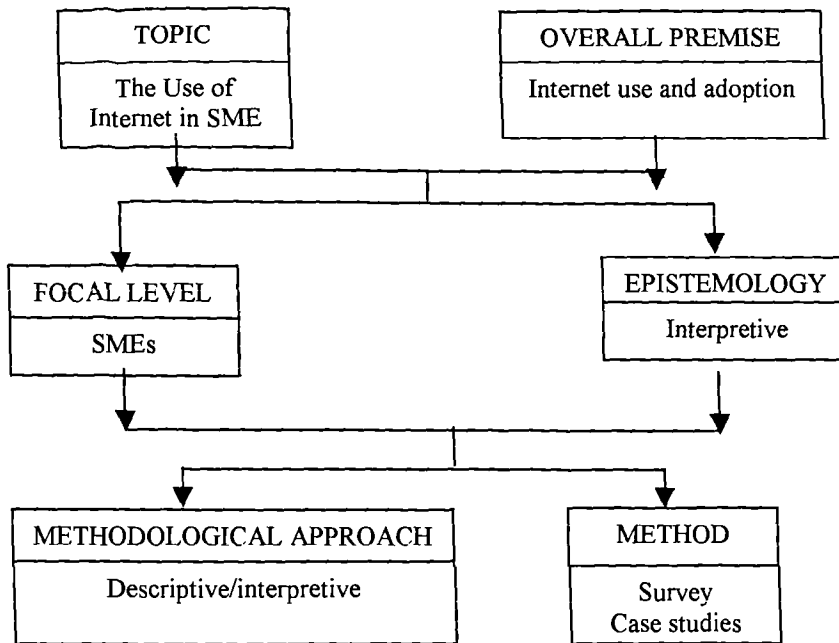


methodology of quantitative and qualitative approaches that utilised the survey and case study methods respectively.

The use of a mixed methodology approach captures a more complete, holistic and contextual portrayal of the phenomenon under study. It also uncovers some unique variance which otherwise may have been neglected by using a single method (Denzin, 1989). The author argues that the examination of the research arguments based on a single method approach might be limited in scope. Mitroff and Linstone (1993) pointed out that in today's messy world, to achieve success demands that one be able to examine problems from "multiple perspectives". Each of these perspectives is of value in that it views a problem through a distinct lens and offers perceptions not encompassed by the others. None by itself suffices to deal with a complex and dynamic problem, but together they give a richer and fuller picture of the phenomenon.

The survey was combined with the case study method to provide deeper insight on the factors that influence adoption and also to complement and strengthen the findings of the research study. Robson (1993) suggests that when the purpose of the research is descriptive, then survey will be the most appropriate method however, if the purpose is exploratory then case study method will be the most appropriate. The purpose of the study is both descriptive and exploratory. Although the survey and case study methods are classified under the traditional empirical side of Galliers framework, their adoption here is based on epistemological assumptions of interpretivism. The survey and case study methods adopted are described; the limitations of these methods and the justification for adopting a mixed methodology approach in this study are discussed. Figure 4.2 shows an outline of the research approach chosen for this study.

Figure 4.2 Outline of research approach



Source: (Walsham, 1993)

#### 4.3.1 Survey method

Surveys are snapshots of practices, situations or views at a particular point in time, undertaken using questionnaires or interviews. Responses are collected directly from the respondents and assumed to be unaffected by context. Confounding influences are measured and controlled statistically. The advantage of survey research is that large amounts of data can be collected relatively easily and cheaply in a variety of settings. The survey approach can provide a reasonably accurate description of the real world situations from a variety of viewpoints. It seeks to discover relationships that are common across organisations and hence allow the generalisation of results to broader populations.

It has been suggested (Kraemer and Dutton, 1991) that survey research is both the most widely used and most questioned method in the management information systems field. The survey method was chosen for this research because of its ability to handle large sizes and numbers of variables simultaneously (Galliers, 1992). The purpose of the survey was to elicit background information about the SMEs and to obtain a preliminary understanding of current Internet usage and to discover relationships that are common across SMEs and hence provide generalisable

statements on how they use the Internet in business. The use of survey in this study was important, because the analysis from the survey questionnaire highlighted issues, which needed to be resolved through case study interview with SMEs. The survey was designed in this study to collect descriptive data and made no provision for interaction with the participants. Although it provided a comprehensive picture of current Internet usage and it discovered patterns that were common across the surveyed SMEs, it failed to provide an explanation of how and why SMEs use the Internet or the factors that influence their decision to adopt Internet technology in business. The survey phase of this study sets much of the agenda for the qualitative phase by providing descriptive information.

#### ***4.3.2 Case study method***

Following the survey, a multiple-case study was carried out to elicit qualitative information to complement the shortcomings of the survey research method. The study used case study method and grounded theory technique (Strauss and Corbin, 1990) to analyse the case data. This was necessary to provide a comprehensive understanding of the issues under investigation. The case studies differ fundamentally from surveys (and from laboratory experiments and field studies) in that the researcher generally has less presumptive knowledge of what the variables of interest will be and how they will be measured (Gable, 1994). The purpose of the case study was to provide an understanding of the factors that influence SMEs decision to adopt and use the Internet in business.

Yin (1984) suggests that case studies are appropriate where the objective is to study contemporary events, and where it is not necessary to control behavioural events or variables. Yin (1994) defines case studies as "an empirical inquiry that investigates a contemporary phenomenon within its real life context, especially when the boundaries between a phenomenon and context are not clearly evident; and in which multiple sources of evidence are used". The contemporary phenomenon being investigated by this research is the understanding of how the Internet is used within the context of small to medium-sized enterprises. The phenomenon has to be investigated in its real-life context because all the variables in that context contribute to its understanding.

Case study has a long tradition in IS research as a method of providing rich and contextual data. Case study is the most widely used qualitative research method in information systems research (Benbasat, Goldstein, and Mead, 1987; Orlikowski and Baroudi, 1991; Galliers, 1992; Myers, 1997, 1998; Yin, 1994; Gable, 1994; Walsham, 1993, 1995; Cavaye, 1996). Orlikowski and Baroudi (1991), Benbasat et al (1987) and Myers (1997) argue that case study method is particularly appropriate for the study of information systems development, implementation and use within organisations.

Furthermore, it is well suited to where an understanding of interactions between information technology-related innovations in organisational contexts is needed (Darke, Shanks, and Broadbent, 1998). Case study can be used in various ways from within different research perspectives using a variety of data collection and analysis methods, producing diverse types of research outcomes (Cavaye, 1996). Darke, Shanks and Broadbent (1998) argue that case study method can be used to provide descriptions of phenomena, exploration, prescription, build theory or to test existing theoretical concepts and relationships (Benbasat et, 1987; Cavaye, 1996).

Orlikowski and Baroudi (1991) note that case study methods are appropriate to generating valid interpretive knowledge, as these examine humans within their social setting. It is particularly appropriate when theoretical knowledge on the phenomenon under investigation is limited and an understanding is not well developed (Benbasat, Goldstein, and Mead, 1987). These include areas where a phenomenon is dynamic and not yet mature or settled, such as Internet adoption and usage where there are few existing theories to explain the phenomenon (Hutchinson, 1988). Its use was considered particularly relevant in understanding the use of the Internet in SMEs. This is because the use of the Internet in business is developing so quickly and because little was known about the actual Internet usage in this sector at the time data was gathered, and also Internet usage research and theory are in an early stage of development. It was used in this study to describe and conceptualise the phenomenon of Internet usage in SMEs. It provided the mechanism for understanding the meaning of behaviour and attitudes expressed in questionnaires and the subtleties prevalent in a research environment (Lymer, Nayak, Johnson, and Spaul, 1998).

Just like all research strategies, case study method has its strengths (Galliers, 1992; Yin, 1989, 1994), it has the ability to capture realities in greater details by studying a phenomenon in its natural context and the ability to analyse more variables than is possible using any other methods (Benbasat, Goldstein, and Mead, 1987). It also provides the opportunity to ask penetrating questions and to capture the richness of organisational behaviour. However the conclusions drawn may be specific to the particular organisations studied. It is valuable in developing and refining concepts for further study. It provides rich, explanatory evidence that can be used to explain why and how phenomena occur. Case studies are appropriate for studying topics where attitudes and behaviours can best be understood within their natural setting. Benbasat et al (1987) further identify three strengths of case study method in information systems: (1) the researcher can study information in a natural setting, learn about the state of the art, and generate theories from practice; (2) the method allows the researcher to understand the nature and complexity of the process taking place; (3) valuable insights can be gained into new topics emerging from the rapidly changing information systems field.

The case study enabled detailed study of the concepts in their own natural context. Not only did the participants discuss their interpretation of Internet usage concept, but the organisational context was also analysed for relationships to the concept. Its use helped in more intelligent interpretation of the patterns discovered in the analysis of questionnaire data. It provided a much richer picture of the world than can be obtained from survey (Yin, 1994), which was restricted to gathering information related to the questions on the survey instruments. The use of case study was based on the interpretive epistemology of understanding and interpreting occurrences as well as the meanings SMEs give to the phenomenon under investigation. The case study method used in this study was part of a broader research strategy which included a survey of 400 SMEs (see Gabbie (1994) for a discussion of the benefits obtained from combining case research with surveys in information systems). The next section discusses the limitation of the research method chosen for this study.

#### ***4.3.3 Limitation of research method***

As with all research designs, this study's approach has both strengths and weakness. It is necessary to acknowledge these weakness, if only to ensure that the study's results

can be placed in an appropriate context as well as to ensure that future research improves upon the present design. A number of problems have been identified in relation to these research methods.

The draw back of survey was that little insight was obtained regarding the cause/processes behind the phenomena being studied; possible bias in respondents (self-selecting nature of questionnaire respondents); the researcher, and the moment in time when the survey was undertaken. The survey method was found to be too restrictive, sterile, too statistical and manipulative in nature. De Vaus (1992) reported that some of the general criticisms against survey method included the philosophical arguments regarding its incapability of providing holistic investigation into phenomena, its nature of determinism and empiricism, and its attempt to measure everything. The criticisms of survey within the IS discipline included its incapability of yielding a cumulative body of knowledge, and its ill suitability for addressing the subtle dynamics of IS in complex social settings (Kraemer and Dutton, 1991). They argue that even though these criticisms may be valid, the survey approach still has a very important and constructive role in the discipline. The survey method sets much of the agenda for the qualitative case study phase of this research by providing descriptive information about Internet usage in SMEs.

Although case study method was useful as a means of examining the factors that influence SMEs decision to adopt the Internet, there were some practical difficulties associated with attempting to undertake case studies as rigorous and effective methods of research regardless of the philosophical perspectives adopted (Darke et al, 1998). Despite the attempts to gain the best possible quality of information, there were still a number of limitations for example, lack of quantitative evidence (e.g. financial figures) because most participants were not prepared to reveal these data. Designing and scoping a case study project in order to ensure that the research questions can be appropriately and adequately answered can be difficult. The availability of suitable case study sites may be restricted, as business and other organisations are not always willing to participate in case study research. The sheer amount and variety of data from case study may inhibit data analysis, especially as strategies and techniques for analysing qualitative data are not well established (Miles and Huberman, 1984, 1994; Yin, 1994; Cavaye, 1996).

The data collection and analysis processes in case study method are both subject to the influence of the researcher's characteristics and background, and rely heavily on the researcher's interpretation of events, documents and interview material (Galliers, 1992) and these may limit the validity of the research findings. These different interpretations of events by researchers are usually attributed to the author rather than the approach, as the result of case studies depends greatly on how they are conducted (Galliers, 1992). Kaplan and Duchon (1988) point out that understanding of reality is based on researcher interpretation of the data. They argue that researchers may interpret the same data in different ways.

The issue of biases introduced by the researcher during the collection and analysis of case data also needs to be considered. The interpretive researchers acknowledge the subjectivity of their analysis in that their predisposition, beliefs, values and interests always intervene to shape their investigations (Orlikowski and Baroudi). Darke, Shanks, and Broadbent (1998) identify two types of biases: (1) the effects of the researcher on events and the behaviour of participants at the case study site. (2) The researcher's own beliefs, values and prior assumptions which may prevent adequate investigation and consideration of possible contradictory data, and unduly influence the analysis of the case study evidence. All research methods are guilty of bias to varying degrees, according to Yin (1994); bias may enter into the design and conduct of any other types of research methods, he advises researchers that care must be taken in conducting any research.

Biases in the researcher's collection and analysis of case data was counteracted by using multiple sources of evidence to provide multiple instances from different sources (Miles and Huberman, 1984, 1994). The researcher probed for further explanation when faced with inconsistencies or illogical arguments during the interview. The research findings were compared with other similar studies in this area for anomalies and also it was discussed with colleagues and with the research supervisor in some detail. The case study findings were strengthened by the convergence of information from a variety of sources, providing multiple measures of the same phenomenon (Yin, 1994). Multiple sources of evidence also assisted in corroborating information provided by different participants where there were conflicting accounts of events and actions.

Case study has also been criticised for lack of generalisation. Case studies are generalisable to theoretical propositions and not to populations (Yin, 1988). Case results can be used to develop theoretical statements on which theory is built. It can yield data from which process theories and richer explanations of how and why processes and outcomes occur can be developed (Kaplan and Duchon, 1988). Walsham (1993) states that criticisms of case study method for empirical research tend to focus on the non-representativeness and lack of statistical generalisability arising from the research. This is sometimes excused on the grounds that the case study is being used as an exploratory method of analysis prior to, or in addition to, more detailed large sample work (Walsham, 1993).

This is not the argument in favour of the case study method used in this study. The main argument here, as discussed by Smith (1989), is that epistemology, the basis of one's claims to knowledge and research methods, is interrelated. If one adopts a positivist epistemological stance, then statistical generalisability is the key goal. The epistemological stance of this research is interpretive. Walsham (1993) argues that the validity of the inferences drawn from one or more cases does not depend on the representativeness of cases in a statistical sense, "but on the plausibility and cogency of the logical reasoning used in describing the results from the cases, and in drawing conclusions from them". Walsham suggests that there are four types of generalisations from interpretive case studies: the development of concepts, the generation of theory, the drawing of specific implications, and the contribution of rich insight (Walsham, 1995).

The generalisation from the setting to a population is not sought, rather, the intent is to understand the factors that influence the adoption of the Internet in business, which has been argued could be used to inform other similar settings. The study was concerned in seeking a theory that was compatible with evidence that was both rigorous and relevant and generally useful to other areas. This is more in line with the constructivist criteria for quality of research, which relies upon the richness or authenticity of the learning that is achieved, and an understanding of the constructions of others (Hughes and Wood-Harper, 1999). The next section justifies the use of mixed methodology approach.



#### ***4.3.4 Justification for using mixed-methodology approach***

Although the use of a single methodology has been advocated by a number of authors, many of the supporting arguments are decidedly pragmatic, such as time constraints, the need to limit the scope of a study, and the difficulty of publishing the findings (Creswell, 1994). The crucial aspect in justifying a mixed methodology research design is that both single methodology approaches (quantitative and qualitative only) have strengths and weaknesses. The combination of methodologies, on the other hand, can focus on their relevant strengths. The researcher aims to achieve the situation where "blending qualitative and quantitative methods of research can produce a final product which can highlight the significant contributions of both" (Nau, 1995), where "qualitative data can support and explicate the meaning of quantitative research" (Jayaratne, 1993). By adopting the following assumptions, the researcher ensures that the final product maximises the strengths of a mixed methods approach.

Qualitative method excels at "telling the story" from the participant's viewpoint, providing the rich descriptive detail that sets quantitative results in their human context. Adoption and usage of the Internet involves cognitive and attitudinal characteristics, thus a qualitative approach is appropriate to investigate these aspects, by examining the participants' point of view. Much of Internet usage research is still largely exploratory. The use of qualitative methods allows for the development of theory that may arise as part of such research. It allows the researcher to develop an overall picture of the phenomenon under investigation by describing it in great detail, in the original language of the research participants. However, when a researcher has that kind of detail, it's hard to determine what the generalisable themes may be, this is often an especially challenging issue. Because much qualitative research takes an enormous amount of time, it is very labour intensive, and yields results that may not be generalisable for policy-making or decision-making. While quantitative research excels at summarising large amounts of data and reaching generalisations based on statistical projections. Quantitative analysis may complement the findings of qualitative methods, and may confirm or disconfirm any apparently significant data that emerge from the study.

It is argued that the selection of a research strategy entails a trade-off: the strengths of one approach overcome the weakness in another approach and vice versa, and an attempt to accommodate them pluralistically leads to a far more complete picture (Fitzgerald and Howcroft, 1998). Many researchers have adopted such a stance, arguing that research approaches should not be viewed as mutually exclusive (Jick, 1983; Banville and Landry, 1992; Hirschheim, 1992; Avison and Myers, 1995). Mixing research methods can lead to new insights and modes of analysis that is unlikely to occur if one method is used alone (Kaplan and Duchon, 1988; Orlikowski and Baroudi, 1991).

A sizeable number of researchers (Gable, 1994; Kraemer and Dutton, 1991; Denzin, 1989; Easterby-Smith et al, 1991; Orlikowski and Baroudi, 1991; Cavaye, 1996; Denzin, 1989; Kaplan and Duchon, 1988; Jick, 1979; Wynkoop, 1992; Lee, 1989; Benbasat, Goldstein and Mead, 1987; Danziger and Kraemer, 1991; Attewell and Rule, 1991; Bonoma, 1985) have argued and put forward a number of reasons for mixing research methods: (1) it enables the building of a fuller, richer picture surrounding a phenomenon than either method on its own would be able; (2) it increases the robustness of results because findings can be strengthened through cross-validation achieved when different kinds and sources of data converge and are found congruent; (3) it helps find explanations for diverging results; (4) researchers can capitalise on the strengths of each and minimise weakness inherent in single strategies; and (5) it can increase the validity of the research findings. In addition, several other researchers (Denzin and Lincoln, 1994; Guba 1985; Guba, 1990) have suggested that researchers should feel free to mix features of quantitative and qualitative paradigm or to adapt desired features from each at will.

Attewell and Rule (1991) highlight the 'complementary between survey and fieldwork approaches to studying information technology', stating that 'each is incomplete without the other'. They suggest that, 'conventional survey methods, such as mail questionnaires and telephone interviews, are inappropriate for many of the issues that needs to be addressed in information system research, and that a mixed method approach is more effective'. Gable (1994) suggests that this view is desirable in most areas of social research, especially in a newly emerging sub-field as the study of IS in organisations. Gable identifies two main reasons for supplementing

quantitative survey data with qualitative case study data: (1) to develop contextual richness that is valuable in model building; (2) to improve internal validity and interpretation of quantitative findings. He argues that combining the main strength of survey (generalisability/external validity) with the main strength of case studies (complexity and discoverability) can yield a superior piece of research.

Danziger and Kraemer (1991) point out that survey research and fieldwork have always been alternative rather than competing sources of evidence and ideas. Similarly, Jick (1983) argues that combining different methods may be used not only to examine the same phenomenon from multiple perspectives, but also to enrich understanding by allowing new or deeper dimensions to emerge. Denzin (1989) suggests that researchers should examine a problem from as many methodological perspectives as possible. Denzin argues that the flaws of one method are often the strengths of another; and by combining methods, researchers can achieve the best of each while overcoming their unique deficiencies.

The IS field is concerned not only with the development of new information technologies but also with questions such as how they can be best applied, how they should be managed, and what their wider implications are to individuals, organisations and society in general. Banville and Landry (1992) suggest that information systems are by nature a pluralistic field, which implies that the use of different approaches and methods is appropriate and valid. They argue that a pluralistic strategy would allow for different paradigms to be applied in a research situation and it allows for a contingent approaches where different methods with complementary strengths could be used as appropriate. According to Hirschheim (1992), methodological pluralism is one theme that the information systems researchers should support regardless of their epistemological biases.

The field of information systems epistemology draws heavily from the social sciences, and information systems are fundamentally, social rather than technical systems (Hirschheim, 1992; Galliers, 1993). Orlikowski and Baroudi (1991) argue that there is clearly a reciprocal and reflexive relationship between IS research and social reality; the two are not independent of each other. Kaplan and Duchon (1988) argue that interpreting IS in terms of social action and meaning is becoming more

popular as evidence shows that information systems development and use is a social as well as technical process that includes problems related to social, organisation and conceptual aspects of the systems (Kaplan and Duchon, 1988).

The social phenomena studied under IS fields are complex, the existence of a plurality of perspectives allows the exploration of phenomena from diverse frame of reference (Banville and Landry, 1992). From a pluralistic standpoint, any research approach may be appropriate at any one time for the study of IS phenomena, as each strategy throws light on the same phenomenon in a different way (Lee, 1991; Klein and Myers, 1999). Pluralism argues that it is the combined knowledge gained from using a variety of research strategies that enables a truly full and rich body of knowledge on phenomena to emerge. This in itself is a powerful argument for pluralism and for the use of multiple research approaches during any investigation (Gable, 1994; Jick, 1983; Kaplan and Duchon, 1988, Denzin, 1989).

Furthermore, Avison and Myers (1995) point out that different research methods are relevant and add to the potential for progress and discovery. Like Landry and Banville (1992) and Hirschheim (1992), they support methodological pluralism in IS. They argue that no single method can ever capture all the richness and complexity of organisational reality, and that a diversity of methods, theories and philosophies is required (Landry and Banville, 1992). Orlikowski and Baroudi (1991), likewise, argue that there is much that can be gained if a plurality of research perspectives is effectively employed to investigate information systems phenomena. They argue that there exists other philosophical assumptions that can inform studies of relationships between information technology, people and organisations, that any one perspective is always only a partial view, and unnecessarily restrictive (Orlikowski and Baroudi, 1991).

In their study of combining qualitative and quantitative methods in information systems research. Kaplan and Duchon (1988) suggest that combining different methods can provide a richer, contextual basis for interpreting and validating results and also the different methods can act as a means of testing one source of information against other sources. They argue that combining methods can be valuable in a particular study, and a variety of approaches and perspectives can be valuable in the

discipline as a whole. They conclude “no one approach can provide the richness that IS, as a discipline needs for further advancement” (Kaplan and Duchon, 1988) and that many of the strengths of one method compensate for weakness in the other (Gable, 1994).

As noted before, the purpose of this section is not to suggest that a mixed methodology is the only suitable research design for this topic, rather it is an appropriate, and desirable design that enabled the understanding of the complex nature and organisational issues associated with the adoption and usage of the Internet in SMEs. The researcher agrees that a mixed methodology approach is more effective in addressing IS issues, and that qualitative and quantitative approaches should be viewed as complements rather than as competitors. A mixed methodology however, has a number of advantages within IS research, as well as other social science disciplines, and may be able to enhance the quality of such work in the ways discussed.

#### **4.4 Data collection**

This section describes how the survey and case study were designed, and how the data was collected. The aim at the data gathering stage is to produce as rich a description as possible of the phenomena being studied. However efficient the subsequent analysis, thin data will result in thin outcomes, which are unlikely to reflect the substantive issues involved. Kling (1991) and Danziger and Kraemer (1991) suggest that it is always best to utilise several methods of data collection to address adequately the impact of information technology. Using multiple techniques can lead to new insights and modes of analysis that is unlikely to occur if one technique alone is used (Kaplan and Duchon, 1988). The use of each technique offers a different avenue for SMEs to express their perceptions of the adoption of the Internet and is more effective in addressing information systems issues. In this study, data was collected through a variety of techniques that included questionnaires, semi-structured interviews and other secondary documents. A further source for comparison was the reviewed literature.

This triangulation across various techniques of data collection was particularly beneficial in theory generation, as it provided multiple perspectives on an issue and

supplied more information on emerging concepts, allowed for cross-checking, and yielded stronger substantiation of constructs (Eisenhardt, 1989; Glaser and Strauss, 1967; Pettigrew, 1990; Orlikowski, 1993). Data collection, coding, and analysis proceeded iteratively (Glaser and Strauss, 1967), with the early stages of the research being more open-ended, and later stages being directed by the emerging concepts. Overlapping data analysis with data collection, as Eisenhardt (1989) notes, provided a number of advantages: "it not only gives the researcher a head start in analysis, but more importantly allowed the researcher to take advantage of flexible data collection. Indeed, a key feature of theory-building case research is the freedom to make adjustments during the data collection process" (Orlikowski, 1993).

#### ***4.4.1 Survey design***

As the first phase of this study sought to gain an understanding of how SMEs currently use the Internet in business, it was decided to use a postal survey questionnaire, to accommodate both Internet users and non-users. The postal survey questionnaire was preferred because it sought to discover relationships that were common across SMEs and hence provided generalisable statements about Internet usage in SMEs. The questionnaire used in this study was developed from similar instruments in past surveys of Internet use in business (Abell and Lim, 1996; DTI, 1998) and was tested in a pilot study of masters' students in information systems department. The pilot study results permitted an analysis of the clarity and discriminatory ability of individual questions and an assessment of respondents' evaluation of overall questionnaire design. Questions that student subjects described as ambiguous were rephrased and those that did not yield adequate response variation were eliminated.

The survey phase of the research was descriptive in nature, the survey did not attempt any theoretical grounding, and rather the aim of using it in this study was to obtain a preliminary understanding of how SMEs currently use the Internet in business. Specifically, the survey managed to obtain a demographic profile of SMEs that were not using the Internet and those that were, and the type of activities they used the Internet for. The survey made no provision for interaction with the participants and it did not contribute to the development of the Internet adoption model in this study.

#### *4.4.1.1 Sample and procedure*

The research recognises two kinds of organisations in the context of the study and these are considered the target population of the research. The organisations are small business and medium-sized enterprises (as defined in chapter 1). SMEs from different types of industry sectors were included in this study, in order to avoid bias in the study outcome. The names and addresses of SMEs were obtained from companies listed in the financial analysis made easy (FAME) database, which contained over 100,000 businesses in the UK. The postal mail questionnaire was chosen over electronic forms because it was easier to fill out and because it was also used to send the instrument to those SMEs that were not using the Internet in their business.

A random sample was used to select the SMEs that participated in the study. The random technique was deemed appropriate because it guaranteed that each SME in the database list had an equal chance of being selected for the study. The results obtained from measuring the sample could be generalised to the SMEs population. On the other hand, using non-random sampling would not ensure that SMEs were selected in random manner. It would be very difficult to guarantee that certain groups of SMEs population would not be excluded from the sample since SMEs do not have an equal chance of being selected from the database list. Therefore, a non-random technique was not deemed appropriate, because the results that would be obtained from the study could not be generalised to all the SMEs population.

Data was collected using a postal mail survey administered in the UK between March and May 1999. Before the questionnaire was sent out, it went through extensive pre-testing with masters' students in the information systems department to clarify various issues relating to readability and quality of scales used in the instrument. Particular attention was focused on the structure, sequence and overall presentation of the items in the questionnaire. On the basis of their comments, changes were made to the questionnaire to clarify wording and increase readability. The final version was further reviewed by the researcher's supervisor (see appendix 3 for a sample of the survey questionnaire). It was agreed with the researcher's supervisor that 350 to 400 SMEs be sent out in order to get a reasonable response rate.

After revision, an initial questionnaires and covering letter explaining the purpose of the study was sent out in March 1999, to 400 randomly selected SMEs in a variety of industries in the UK, that met the criteria (see appendix 1 for a sample of the explanatory letter). The survey was described as a university-sponsored research project, and respondents were assured of confidentiality. Each of the questionnaires were addressed to the information technology (IT) manager and in cases where no such manager exist it was directed to the managing director in the participating SMEs. The questionnaire was targeted at IT managers because in most organisations, they are responsible for decisions regarding Internet usage in their companies and they are in a better position to discuss Internet usage and the factors that influence their organisations to adopt the Internet. A prepaid reply envelope was provided for the return of the responses.

One month later, reminder questionnaires with follow-up letters (see appendix 2 for the follow-up letter) were mailed to all the respondents who had not replied to the survey by the specified deadline. A second mailing was deemed necessary, as the response rate from the first mailing was inadequate. In total, 98 questionnaires were returned, which constituted a 24.5% response rate, out of these 6 questionnaires were returned unfilled. This was primarily due to company policy not to complete questionnaires or the company had been bought by a larger company, which fell outside the definition of SME, or the company was no longer in business. Data from the 92 completed questionnaires (23%) was analysed using a statistical package for social science (SPSS for windows version 10.1). Details of the survey analysis are presented in chapter 5.

#### *4.4.1.2 Measures*

The questionnaire was composed of four parts: an Internet usage section, the benefits section, the barrier section, and the company background section.

*Internet usage:* The first part consisted of measures adapted from previous surveys on IT usage (Abell & Lim, 1996; DTI, 1998). The usage construct was measured by asking respondents whether their firms had an Internet account. For companies with an Internet account, respondents were asked what they use the Internet for, the *resources of the Internet used* and whether their firms had a web site. Hence,



respondents were separated into three groups: those without an Internet account (non-users), users without web sites, and users with a web site. Use of the Internet is defined as the ways in which SMEs use the Internet in business. Uses included dealing with customers and suppliers and internal company use.

*Internet benefits:* The second part asked the respondents to choose from a list, the perceived benefits of using the Internet. Internet benefit is defined as the perceived benefits the Internet can offer SMEs in their business (e.g. customer satisfaction). These benefits were identified from the literature (DTI, 1998) and from informal conversations with individuals involved in electronic commerce.

*Internet barriers:* The third part dealt with some of the barriers that may prevent SMEs from using the Internet. Respondents were asked to rate each of the potential barriers on a 3-point Likert scale (1 very important 2 important 3 not important). Barrier is defined in this study as an obstacle, which prevents or inhibits SMEs from fully exploiting the potential of the Internet in business. Once again, these barriers were identified from the initial literature

*Company background:* The fourth part of the survey instrument concluded with questions eliciting the background information of the participating SMEs. Respondents were asked to provide demographic information (e.g., role in the company, number of employees, annual turnover and type of industry)

#### **4.4.2 Case study design**

The second phase of this study used an emergent, exploratory, inductive qualitative case study approach. This was because the basis of such an approach is one that does not predetermine or delimit the directions the investigation might take. According to Lincoln and Guba (1985), the emergent design of a naturalistic inquiry does not allow for a detailed plan before the research began "the research design must therefore be 'played by ear'; it must unfold, cascade, roll and emerge". The design for the case study began as a broad outline of contingency plans open for modification and extension as necessary during the course of the study (Cantrell, 1997). The design assumed a worldview in which there are multiple realities, that is the world is not an objective thing out there, but a function of interactions and perception (Merriam,

1988). These realities are complex, dynamic and change overtime. This view is important to this research which is attempting to bring understanding and interpretations to processes or events as perceived by SMEs in their natural setting.

Following the survey, a case study was carried out to elicit qualitative information to complement the shortcomings of the survey. The case study was designed to add a richer dimension to the survey data. The findings from the survey showed how SMEs used the Internet in business and what tools they used the Internet for, but the survey fell short of addressing why SMEs adopt and use the Internet in business. To provide reasons why SMEs use or don't use the Internet in their business, the author conducted a multiple case study between June and August 2001 with seven SMEs that had previously completed the survey questionnaire in 1999.

As mentioned earlier, case study method lends itself to getting out into the natural setting of the phenomena under investigation. The benefits of multi-case study have been discussed by other information systems researchers (Yin, 1984). According to Yin, case study can involve single or multiple cases and numerous levels of analysis. Yin suggests that multiple case designs are desirable when the intent of the research is descriptive, theory building or theory testing. Benbasat et al. (1987) point out that such an approach is suitable for investigating "certain types of problems: those in which research and theory are at their early formative stages; and sticky, practice-based problems, where the experiences of the actors are important and the context of action is critical". They argue that multiple case studies enable the researcher to relate differences in context to constants in process and outcome and also multiple case allow for cross case analysis and the extension of theory. Miles and Huberman (1984) argue that multiple cases enable the researcher to verify that findings are not merely the result of idiosyncrasies of the research setting.

Earlier studies (Baker, Fuller and Jenkins, 1997; Poon and Strom, 1997; Poon and Swatman, 1999) on SMEs and the Internet have made use of multi-case studies to gather data. The multi-case study was designed as a series of interviews and site visits. Most authors are vague when it comes to suggesting how many actual cases to study, but Eisenhardt (1989) suggests that multiple case design requires the study of at least four, but not more than ten cases. For pragmatic reasons of time, the number of

cases in this study was planned in advance; the study involved seven SME cases. These cases were purposefully selected from the SMEs that had previously completed the survey questionnaire in phase one of the study. The case studies described in the next section were the cases used in this study, employing multiple data sources and have as their main focus the factors that influence Internet adoption in SMEs. The multiple data sources have been chosen to give as many insights into the phenomenon as is feasible and to assist in theory generation.

#### *4.4.2.1 Case participants*

Out of the 92 SMEs (23% response rate) that completed the questionnaire in the survey phase of the research, 26 SMEs were approached to participate in the second phase of the research--case study. The criteria for inclusion were based on a need for each participating SME to conform to the definition of SMEs in chapter 1 and a willingness on the part of the SME owners/managers to disclose details of their business. Several potential SMEs were rejected on the grounds that they did not satisfy the criteria. A total of seven SMEs that satisfied the criteria were chosen to participate in this study. These SMEs were chosen across business sectors so that the study could investigate the existence of sector-independent issues. This was important to avoid observations specific to a particular sector. The first SME was selected at random from the seven SMEs that participated in this study, to provide the first body of data. Then subsequent data collection was guided by the theoretical sampling principle of grounded theory as defined by Strauss and Corbin (1990); i.e. sampling on the basis of concepts that have proven theoretical relevance to the evolving theory. In a grounded theory theoretical sampling cannot be fully planned before the study commences.

Letters were then sent to the owner/managers of each of the selected SMEs requesting a one-hour interview, (see appendix 4 for the sample request letter). An availability form indicating choices of available dates and time for interview was also sent (see appendix 5 for a sample of the availability form). The purpose of the study and the nature of the research were clearly spelled out as were assurance of confidentiality. The participants were asked open-ended questions aiming to clarify answers in the survey research and to gather additional information that was not captured by the survey. The case study helped to provide an in-depth understanding of the underlying

issues important to the study such as the barriers hindering the use of the Internet and the factors that influence SMEs decision to adopt the Internet in business. The primary details of the SMEs that participated in the case study are shown in table 4.2 in no significant order and appendix 9 contains a summary of each SME.

Table 4.2 details of SMEs that participated in the case study

SMEs	Type of business	Size (employees)
BIL	Peugeot cars franchise holder	20
BPC	Publishing	25
SAH	Health care	200
MGL	Manufacturer of contract carpets	9
AL	Manufacturer and seller of educational engineering equipment	40
FP	Specialist flooring manufacturer	110
CLR	Cigarette paper manufacturer	180

Source: (case study data)

#### 4.4.2.2 Interview

The main tool used for collecting data for the case study phase was semi-structured interview. Interviews are arguably the primary data sources where interpretive case study research is undertaken (Yin, 1994), as it is through interviews that researchers can best access case participant's views and interpretations of actions and events (Walsham, 1995). As stressed by Kaplan and Maxwell (1994), the primary goal of interview is to elicit the respondent's views and experiences in his or her own words rather than to collect data that are simply a choice among pre-established response categories. Interviews are flexible enough to favour adaptation to each context, organisation and also to pursue unexpected paths and cues suggested by the theoretical sensitivity (Glaser and Strauss, 1967) developed by the researcher throughout the research process.

Interview was selected as one of the suitable forms to collect data in the case study, because the technique provided face-to-face contact with the social actors and also it provided the additional benefit of allowing the researcher to recognise and process non-verbal communications. The interviews were structured to gather data about the widest possible range of issues associated with the phenomenon under study. The

research questions guided the data-gathering process. The structure and content of subsequent interviews was determined after the data analysis process had commenced. The interviews were used to (a) gather new data about known concepts and categories that have been developed about the phenomenon, (b) clarify answers in the survey questionnaire and to gather new data about the phenomenon, which was not captured by the survey, and (c) involve the SMEs in a process of testing and verifying data and the emerging theory. The use of interview made it possible for the researcher to probe and explore particular responses. Its use enabled the researchers to develop insight into how the participants interpret and make meaning of the world.

Interviews were held with either the owner/manager or someone responsible for IT in the case site. Each interview started with a brief discussion of the purpose of the research carefully designed to arouse the attention and interest of the interviewee. The interviewee was stimulated to respond by some broad questions, but was encouraged to offer their own view of the world and to range more broadly than would be the case in a normal structured interview. These questions focussed on gaining an understanding of the factors that influence SMEs decision to adopt and use the Internet in business.

An interview schedule guide was used which began with questions of the 'grand tour type' (Spradley, 1979) to discover background detail on the participants, to relax the participants by easing them into the interview situation, and to establish the need for responses. The interview guide is presented in appendix 6. The interview guides included several open-ended questions to allow the participants a greater degree of freedom to offer their own answers in their own terms. Emerging concerns and issues were discovered in open-ended response. Answers to questions were compared among respondents, and concepts that evolved were the basis for further data gathering, always leaving room for other answers and concepts to emerge. The researcher also encouraged open discussions toward the end of each interview allowing interviewees to ask questions and add any comments they might want. All data was treated in a way that it protected the confidentiality and anonymity of the SMEs involved in the study. Coding was used during the gathering and processing of interview notes, tapes and transcripts.

Each interview lasted for about an hour and the interviews were tape-recorded and were subsequently transcribed before the data was analysed. Taping the interviews seemed to present no difficulty from the participant point of view. Tape-recording of interviews is often suggested (Miles and Huberman, 1994; Yin, 1994; Darke, Shanks, and Broadbent, 1998) as a means of providing a complete description of the interviewees' response and comments. However, with any method, there are both advantages and disadvantages with various forms of data collection. Tape-recording can inhibit the interviewee, the reliance on tape recordings can prevent the researcher from listening carefully and participating fully in the interview process (Darke, Shanks, and Broadbent, 1998).

To enhance the validity of the answers, summaries of the major findings of each interview were verified with participants for accuracy. Upon receiving confirmation, a matrix was developed to enable within and across case analyses. This form of data analysis enabled the researcher to seek out and verify themes within text. Where possible, formal documentation supporting interviewees' Internet usage was sought and the interviews were supplemented by other secondary data sources such as company documents. Themes covered during the Interviews included background details of the firm, the current status of Internet usage, factors influencing adoption, and barriers to adoption.

The interview format and approach were tested and refined in the pilot study. This process fine tuned the data-gathering methods and heightened the theoretical sensitivity towards the phenomenon. *Theoretical sensitivity refers to the* 'attribute of having insight, the ability to give meaning to data, the capacity to understand, and capability to separate the pertinent from that which isn't' (Strauss and Corbin, 1990).

#### 4.4.2.3 Secondary data

In addition to the primary data collection described above, attention was also given to the collection of secondary materials as appropriate for each case. Document analysis and texts provided valuable sources of qualitative data (Miles and Huberman, 1994; Kaplan and Maxwell, 1994). Secondary documents provided additional information as well as verifying and corroborating the information gained through interviews. They offered some insight into the domain of the analysis, for example a brief history of the

organisation, reports, newsletters, promotional material, Internet web sites and other internal publications were collected and analysed. These materials provided a wealth of information, some of which were not available through interview, they helped in confirming information from other sources and provided different perspective on similar information. This ensured that the theory generated from this research is based on more than the perceptions of the SMEs. It also allowed the researcher to pursue and test out relationships between theoretically relevant categories. Previous surveys of Internet usage, published studies, SMEs' documents and texts dealing with the adoption and use of the Internet and the impacts on business were also used as sources of data, such documents provided a 'rich source of information, contextually relevant and grounded in the contexts they represent' (Lincoln and Guba, 1985).

#### **4.5 Data analysis**

This section discusses data analysis in qualitative case study research. One of the main problems of conducting qualitative research is to decide an appropriate starting point for the research, and the basic framework within which the data will be collected and analysed. In quantitative research, it is possible to make a clear distinction between gathering data and analysing data. However, this distinction is not clear-cut in qualitative research. According to Tesch (1990), analysis of data in qualitative research is a concurrent process with the collection of data; the data collection and analysis inform or drive each other.

When encountering qualitative analysis for the first time, one is confronted with both the number of methods and the difficulty of analysing and presenting large amounts of data. Qualitative studies tend to produce large amounts of data that are not readily amenable to mechanical manipulation, analysis and data reduction (Yin, 1984). It not only generates large amount of data, but it generates data in a non-standard format which makes analysis problematic (Turner, 1983). Qualitative analysis provides an opportunity for the researcher to gain information and gather insights that may be overlooked with traditional data analysis techniques. The analysis of the case study was done in pursuant to guidance provided by many scholars in this field, (such as Glaser, 1978; Glaser and Strauss, 1967; Lofland and Lofland, 1984; and Taylor and Bogdan, 1984).

The process of data analysis in qualitative research “involves working with data, organising it, breaking it down, synthesising it, searching for patterns, discovering what is important and what is to be learned, and deciding what you will tell others” (Bogdan and Biklen, 1982). Spradley (1979) refers to analysis as a “systematic examination of something to determine its parts, the relationship among parts, and their relationship to the whole”. While Miles and Huberman (1984) describe data analysis as consisting of three concurrent activities: data reduction refers to the process of selecting, simplifying, abstracting and transforming the new case data. They argue that data collection and data analysis should overlap to allow for flexibility in data collection procedures so that the researcher remains open to new ideas or patterns which may emerge.

There are many ways of analysing qualitative data and a number of approaches were considered such as hermeneutics, content analysis and semiotics (Myers, 1997). These approaches come from diverse fields and all offered the possibility of different insights on the data. These approaches were evaluated from the perspective of whether the approach drew on all features of case study and whether the philosophy of the approach imposed any pre-existing theories. Eisenhardt (1989) suggests that theory building research must begin as close as possible to the ideal of no theory under consideration and no hypotheses to test since preordained theoretical perspectives may bias and limit the findings.

The selection of grounded theory (Glaser and Strauss, 1967; Glaser, 1978; Strauss, 1987; Strauss and Corbin, 1990, 1998) amongst a myriad of other qualitative analysis methods is not arbitrary but rather because it has been a dominant paradigm for social research (Hughes, 1999) and its use is increasing in the IS field. The objective of this study is the development of a conceptual model that explains the adoption of the Internet in SMEs and fits well with the philosophical nature of grounded theory. Accordingly, proponents of the grounded theory advocate that an approach which concerns itself with the meanings, definitions, and interpretations which are made by the subjects of the study has greater potential for depicting their world and priorities more accurately than methods which begin by preconceiving the world and its meaning (De Búrca and McLoughlin, 1996). The researcher did not come to the field with a well-defined set of constructs and instruments with which to measure the social



reality; rather the researcher derived the categories from the field by in-depth examination and exposure to the phenomenon. The next section describes grounded theory and the procedure for analysing data.

#### **4.5.1 Grounded theory**

This section discusses grounded theory (Glaser and Strauss, 1967; Martin and Turner, 1986; Turner, 1983; Glaser, 1978; Strauss, 1987; Strauss and Corbin, 1990, 1998) and why it was chosen as the main qualitative tool for analysing the case study data. The grounded theory originates in the work of Glaser and Strauss (1967) and is a method that has been used extensively across a variety of social science disciplines. A grounded theory is one that is discovered, developed, and provisionally verified through systematic data collection and analysis of data pertaining to a particular phenomenon (Strauss and Corbin, 1990). Grounded theory is invaluable when conducting theoretical research; the technique has some attraction for a researcher using qualitative techniques for the first time and it offers well sign-posted procedures. The methodology of grounded theory is iterative, requiring a steady movement between concept and data, as well as comparative, requiring a constant comparison across types of evidence to control the conceptual level and scope of the emerging theory.

The goal of grounded theory is seeking a theory that is intimately tied with the evidence, so that the resultant theory is likely to be consistent with empirical data (Orlikowski 1993; Eisenhardt 1989). Data collection method, coding rationale, integration of categories, abstracting from the *data and construction* of theory are thus guided by theory as it emerges. Hughes and Wood-Harper (1999) report that the main application areas of grounded theory are most notably in Glaser and Strauss' own research into status passage, but also in a number of other, usually medical or nursing related areas such as: experiences with chronic illness (Charmaz, 1980); the management of a hazardous pregnancy (Corbin, 1992); homecoming (Hall, 1992). Additionally much work has been done with respect to guidance on the use of grounded theory method. Most notable amongst them include (Turner, 1983; Martin and Turner, 1986; Strauss, 1987; Charmaz, 1983; Strauss and Corbin, 1990). The use of grounded theory has also spread to many other disciplines including research in *information systems* (Torasker, 1991; Pidgeon, Turner and Blockley, 1991; Oliphant

and Blockley, 1991; Pries-Heje, 1992; Orlikowski, 1993; Pettigrew, 1990; Calloway and Ariav, 1991; Baskerville and Pries-Heje, 1995, 1998).

Grounded theory is a general style of doing analysis that does not depend on any particular disciplinary perspectives (Strauss 1987) and, therefore, would seem to lend itself to information systems research, which can be described as a hybrid discipline. The main aspect of grounded theory, which differentiates it from other qualitative research methods, is its emphasis upon theory development (Strauss and Corbin, 1998). Theory is grounded when it emerges from and generates explanations of relationships and events that reflect the life experiences of those people and processes that the researcher is attempting to understand. It also differs from other qualitative approaches, because traditional qualitative approaches collect the data first before commencing the analysis and long after they have left the research site. In contrast, grounded theory uses the emerging theoretical categories to shape the data collection while doing the fieldwork (data collection and analysis proceed simultaneously). By analysing data from the lived experience of the research participants, the researcher can, from the beginning attends to how they construct their world.

Grounded theory requires that the researcher demonstrates theoretical sensitivity (Glaser and Strauss 1967; Glaser 1978) by being well grounded in technical literature as well as from personal and professional experience and in collection and analyses of the data (Strauss and Corbin 1990). It encourages researchers to steer their thinking out of the confines of technical literature and avoid standard ways of thinking about the data (Strauss and Corbin 1990). The interplay between emergent theory and technical literature comes to the fore when extending generalisations from the study. This is achieved by either integrating supplementary or conflicting analyses into the theory by including them as categories or conditions, or criticising them in terms of what has emerged (Strauss 1987). The use of grounded theory analysis is founded on the premise that the generation of theory at various levels is indispensable for a deep understanding of social phenomena (Glaser and Strauss 1967; Glaser 1978).

Grounded theory is particularly suitable for a case study aimed at exploring the factors that influence the adoption of the Internet in SMEs. It is useful for understanding contextual elements (Orlikowski 1993) that constituted the main focus of this case study.

One very practical problem with grounded theory is that the method is extremely labour intensive, requiring the investment of considerable cognitive effort by the researcher. However, the author believes that grounded theory technique is a suitable approach to use, especially when a researcher needs to analyse large quantities of unstructured or semi-structured qualitative data. This section has presented and discussed grounded theory as a practical tool for analysing qualitative data. The next subsection presents the reasons for using grounded theory to analyse the case study data.

#### *4.5.1.1 Reasons for using grounded theory for data analysis*

Grounded theory is chosen for analysing the case study data, with the aim of generating a descriptive and explanatory theory of the adoption of the Internet rooted in the experiences of the SMEs. Strauss (1987) emphasises the usefulness of the case study approach when used with grounded theory. It "is an inductive, theory discovery methodology that allows the researcher to develop a theoretical account of the general features of a topic while simultaneously grounding the account in empirical data" (Martin and Turner, 1986; Glaser and Strauss, 1967). This generative approach seemed particularly useful here given that the objective of the study was the discovery of theory that explains the adoption and use of the Internet in SMEs.

Grounded theory offers a way of attending in details to qualitative material in order to develop systematically theories about the phenomena being studied. Turner (1981) suggests that grounded theory is particularly well suited to dealing with 'qualitative data of the kind gathered from participant observation, from the observation of face-to-face interaction, from semi-structured or unstructured interviews, from case-study material or documentary sources (Turner, 1981). Typically, these particular kinds of inquiry generate large amounts of data, which accumulate in non-standard and unpredictable formats. The grounded theory approach offers the researcher a strategy for sifting and analysing material of this kind. A particular strength of utilising grounded theory is that a documented record of the progress of the analysis is generated. Hence, it is always possible to trace the derivation of any concept or model by checking back through the data and memos.

Grounded theory makes its greatest contribution in areas in which little research has been done. As stated previously, little research has been conducted specifically into adoption of innovations in SMEs context. Most of the research in this field has tended to focus on descriptive Internet usage ([http://www.cc.gatech.edu/gvu/user\\_surveys](http://www.cc.gatech.edu/gvu/user_surveys)) and on demographics, or some other form of Internet pattern (Abell and Lim, 1996; Abell and Black, 1997). The paucity of research about Internet usage and adoption in SMEs means that many of the variables relevant to the concepts of this phenomenon are yet to be identified.

Grounded theory is an appropriate methodology for this study as it generates theory that can be used as a precursor for further investigation of this phenomenon and related issues. Other qualitative research techniques, quantitative methods, or a combination of both can then be used in subsequent studies to test, verify or extend the qualitative propositions that emerge from this research.

A major premise of grounded theory is that to produce accurate and useful results, the complexities of the organisational context have to be incorporated into an understanding of the phenomenon, rather than be simplified or ignored (Orlikowski, 1993; Martin and Turner, 1986; Pettigrew, 1990). This mode of research requires that broader, contextual issues, which are shown to influence the phenomenon under study, be given appropriate recognition in the development of theory. Rather than focusing the investigation by disregarding these broader conditions, every effort was made to acknowledge and account for them.

A number of theoretical approaches emphasise the criticality of organisational context in shaping technology use in organisations, such a conviction also informs this research, and the use of a grounded theory methodology allows the inclusion and investigation of this key organisational element. This inductive approach relies on the researcher systematically collecting, coding, categorising and analysing data to derive the theory that explains the phenomena. The methodology facilitates "the generation of theories of process, sequence, and change pertaining to organisations, positions, and social interaction" (Glaser and Strauss, 1967).

Most IT usage models have tended to neglect the contextual aspect of technology use in literature. An approach that specifically includes elements of process and context is thus particularly appropriate here. The three characteristics of grounded theory inductive, contextual, and processual fit with the interpretive rather than positivist orientation of this research. The focus here is on developing a context-based description and explanation of the phenomenon, rather than an objective, static description expressed strictly in terms of causality (Boland, 1979, 1985; Chua, 1986; Orlikowski and Baroudi, 1991). The research developed theory which described and explained the adoption and usage of the Internet in terms of an interaction of contextual conditions, actions, and consequences, rather than explaining variance using independent and dependent variables (Orlikowski, 1993).

This subsection has discussed the reasons for using grounded theory as analysis tool for the case study. The description of the procedures involved in doing data analysis in grounded theory is the topic of the next section.

#### ***4.5.2 Grounded theory procedures***

The previous section explicated grounded theory methodology. The defining characteristic of grounded theory is that of a general methodology for discovering theory that is grounded in data systematically gathered and analysed. The theory evolves during actual research, and it does this through a continuous interplay between analysis and data collection; data analysis guides future data collection. In this section consideration will be given to the details of the procedures associated with data analysis in grounded theory method.

Strauss and Corbin (1990) have identified three levels of analysis: (a) to present the data without interpretation and abstraction, the participants tell their own story; (b) to create a "rich and believable descriptive narrative" using field notes, interview transcripts and researcher interpretations; (c) building a theory using high levels of interpretation and abstraction. This research combined the second and third approaches, to present rich and detailed descriptions, which allows the reader to make sufficient contextual judgements to transfer the case study findings to alternative settings. The concern here is with the multiple constructions of reality as experienced by SMEs.

Data analysis in grounded theory involves specific procedures which, when applied appropriately and with vigilance will result in theory that is rigorous and well grounded in the data. Strauss (1987) points out that the procedures should be thought of as rules of thumb, rather than hard or fixed rules, and advises researchers to study these rules of thumb, use them, and modify them in accordance with the requirements of their research. In addition, Strauss and Corbin (1998) warn researchers that rigid adherence to any procedure can hinder the analytic process and stifle creativity.

The sample extracts from [AL] and [BIL] transcripts is presented in appendix 7 as an example to demonstrate how grounded theory is applied to the case study (presented in appendix 8). Recording of data may be thought of as a pre-analytic step of grounded theory method and it is said to be essential to the successful generation of grounded theory (Hutchinson, 1988). The grounded theory approach involves coding the assignment of themes and concepts to a selected unit such as sentences taken from an interview transcript. The concepts are combined into related categories; links between categories are identified and verified against the data, and selective coding attempts to integrate the categories into a theory, which accounts for the phenomenon being investigated. The process of analysis in grounded theory is coding data (open, axial and selective), memo writing and theoretical sampling.

#### *4.5.2.1 Coding*

Codes can take the form of a straightforward category label or a more complex one (e.g. a metaphor) (Miles and Huberman, 1994). The coding of data such as field notes and interview transcripts poses questions such as ‘what does this incident indicate?’ (Glaser, 1978). Coding gets the researcher off the empirical level by fracturing the data, then conceptually grouping it into codes that then become the theory, which explains what is happening in the data (Glaser, 1978). Researchers use codes to pull together and categorise a series of otherwise discrete events, statements, and observations which they identify in the data (Charmaz, 1983).

*Open coding* is the analytic process through which concepts are identified and their properties and dimensions are discovered in data. It is the part of analysis that pertains specifically to the naming and categorising of phenomena through close examination of the data. ...During open coding the data are broken down into discrete parts, closely

examined, compared for similarities and differences, and questions are asked about the phenomena as reflected in the data (Corbin and Strauss, 1990). The researcher compares incident to incident with the purpose of establishing the underlying uniformity and its varying conditions (Glaser, 1978). Events, happenings, objects and actions/interactions that are found to be conceptually similar in nature or related in meaning are grouped under more abstract concepts termed “categories” (Strauss and Corbin, 1998).

Glaser (1978) describes a set of three questions that should guide the open coding. What is this data a study of? This question continually reminds the researcher that his original intents on what he thought were going to study just might not be. What category does this incident indicate? The continual asking of this question keeps the analyst from getting lost in the re-experiencing of his data by forcing him to try and generate codes that relate to other codes. It forces code that earns its way into the theory by its grounding in the data. What is actually happening in the data? What is the basic social psychological problem(s) faced by the participants in the action scene? These three types of questions keep the researcher theoretically sensitive and transcending when analysing, collecting and coding the data. They force the researcher to focus on patterns among incidents, which yield codes, and to rise conceptually above fascinating experiences. It is important to emphasise that researchers make codes fit the data, rather than force the data into codes.

*Axial coding* involves re-building the data (fractured through open coding) in new ways by establishing relationships between categories and their subcategories. It is termed “axial” because coding occurs around the axis of a category, linking categories at the level of properties and dimensions (Strauss and Corbin, 1998). Axial codes typically represent categories that describe the open codes. The researcher continues to code and compares the concept to more incidents (Glaser, 1978). Comparison enables the identification of variations in the patterns to be found in the data. Data coding at this level is intended to elevate the data to higher levels of abstraction (Hutchinson, 1988). During axial coding, the analyst begins to fit the pieces of the data ‘puzzle’ together, which were fractured during open coding. Each piece (e.g., category, and subcategory) has its place in the overall explanatory scheme. When building a puzzle, the analyst might pick up a piece and ask, “Does this go here or

there?" The analyst's first attempts are often trial and error. Later, as he becomes more theoretically sensitive, making the fit between conceptual indicator and category becomes easier.

*Selective coding:* the aim of selective coding is to integrate and refine the categories into a theory, which accounts for the phenomenon being investigated (Darke, Shanks, and Broadbent, 1998) and validates the statements of relationships among concepts, and fills in any categories in need of further refinement. In selective coding the researcher reduces data from many cases into concepts and sets of relational statements that can be used to explain, in a general sense, what is going on (Strauss and Corbin, 1998).

#### 4.5.2.2 Memo writing

Memos are devices that depict the relationship among concepts. It is an important way of keeping records of analysis. Martin and Turner (1986) and Strauss (1987) discuss the processes involved in detail. Memo writing takes place throughout the research process starting with the first interview. They serve a dual purpose of keeping the research grounded and maintaining awareness for the researcher. Memos provide an opportunity to generate and develop explanations of the emerging concepts, and to discern some of the interrelationships which exist between them. The memo informs what the code is about and provides the pivotal step of breaking the categories into components and elaborating the codes. Glaser (1978) considers writing of theoretical memos as the core stage in the process of generating theory. Glaser defines memo as "the theorising write-up of ideas about codes and their relationships as they strike the analyst while coding ... memo can be a sentence, a paragraphs or a few pages ... it exhausts the analyst momentary ideation based on data with perhaps a little conceptual elaboration". Memos don't just report data; they tie together different pieces of data into a recognisable cluster, often to show that those data are instances of a general concept.

Memos are one of the most useful and powerful sense-making tools at hand for researchers to use during analysis. The advice is to 'stop and memo' as coding sparks off ideas. You are writing memos to yourself, secondarily to colleagues. Memoing helps the analyst moves easily from empirical data to conceptual level, refining and



expanding codes further, developing key categories and showing their relationships, and building towards a more integrated understanding of events, processes, and interactions in the case. Memoing develops the core category around which the other categories integrate. The core category integrates the theory according to the emergent perspective of investigation and thereby defines its cut-off points. However, the core category has earned its relevance through the grounding of the theory in the domain. 'It must be central, i.e., related to as many other categories and their properties as possible...and account for a large portion of the variation in a pattern of behaviour' (Glaser, 1978). It must also occur frequently, be completely variable, and 'have a clear and grabbing implication for formal theory' (Glaser, 1978). Memos are a rapid way of capturing thoughts that occur throughout data collection, data reductions, data display, conclusion drawing and final reporting. It saturates dimensions of the main categories that have emerged through coding, and constantly generates open questions for further coding and data collection. At the end of the process memos have to be sorted and integrated. Sorting memos simply means putting those that elucidate the same category together in order to clarify its dimensions and to distinguish it from other categories.

#### *4.5.2.3 Theoretical Sampling and comparing*

Two analytic processes contribute to raising categories to conceptual categories: constant comparison, which is central in generating grounded theory and theoretical sampling (Glaser and Strauss, 1967). Both these processes are achieved through a process Glaser (1978) calls theoretical sampling and the selective sampling of the literature. Essentially, the researcher needs to confront the conceptual categories with more data in order to define them carefully, delineate their properties, explicate their causes, and demonstrate the conditions under which they operate, and spell out their consequences.

The constant comparative is central to the data analysis in generating grounded theory. The purpose of focused coding is to build and clarify a category by examining all the data it covers and variations from it. In focused coding, the researcher takes a limited set of codes that were developed in the initial phase and applies them to large amounts of data. The coded data are compared with other data and assigned to clusters or categories according to obvious fit. Glaser (1978) labels this process of comparison

as the constant comparative method, where bits of data are compared with other data and where coded data is constantly confronted with new data for verification purposes. “Comparative analysis forces the researcher to ‘tease out’ the emerging category by searching for its structure, temporality, cause, context, dimensions, consequences and its relationship to other categories” (Huchinson, 1988).

Additionally, it is appropriate and desirable to compare the data categories and constructs that emerge between various groups of participants in the study. In this way the process of constant comparison is intended to generate a theory rich in detail. It moves the researcher more quickly away from describing the specifics of a case to thinking more abstractly about what the various cases share in common and what is different about them.

Theoretical sampling begins during the data collection phase of the study and involves searching the transcripts for emerging categories that characterise the narrative and seem significant. “Theoretical sampling is the process of data collection for generating theory whereby the analyst jointly collects, codes, and analyses... data and decides what data to collect next and where to find them, in order to develop... theory as it emerges. This process of data collection is controlled by the emerging theory, whether substantive or formal” (Glaser, 1978). Theoretical sampling primary function is to provide the researcher with the opportunity to discover properties of the core variable under study by collecting new data to check, fill out and extend conceptual categories. Theoretical sampling and constant comparison reflect cyclical processes which are fluid and flexible, but at the same time they ensure that the analysis is planned and well grounded in the data, rather than haphazard, which can lead the analyst down to unproductive paths and away from the focus of study.

Maximising opportunities for comparing concepts along their properties for similarities and differences enables researchers to densify categories, to differentiate among them, and to specify their range of variability. Once the analyst has some categories, sampling is aimed at developing, densifying and saturating those categories. It is also related to the sensitivity that a researcher has developed to the emerging concepts. The more sensitive a researcher is to the theoretical relevance of certain concepts, the more likely he is to recognise indicators of those concepts in the data. Sensitivity usually grows throughout the research project and enables the

researcher to decide what concepts to look for and where he might find indicators of them.

As constructs are derived from the data, repeated theoretical sampling can be used to increase the depth of focus and to ensure consistency; that is, to ensure that data are gathered in a systematic way for each category (Strauss and Corbin, 1990).

"Theoretical sampling is used as a way of checking on the emerging conceptual framework rather than being used for the verification of preconceived hypotheses" (Glaser, 1978). After developing a set of focused codes into categories the researcher has to weave them together in developing a grounded theory. The emerged-grounded categories, derived from the data, are the basic building blocks for the theoretical understanding of the area under study. The conceptual framework developed from the conceptual categories is tested by collecting data which provides support (or not) for the framework hypotheses and reveals the relationship between the categories, which forms the basis for the subsequent emergent theory.

An important issue in reaching closure is when to stop sampling. Ideally, researchers should stop sampling when theoretical saturation is reached (Glaser, 1992; Eisenhardt, 1989). Theoretical saturation is the point at which incremental learning is minimal because the researcher is observing phenomena seen before (Glaser and Strauss, 1967). The general rule when building theory is to gather data until each category is saturated (Glaser, 1978; Glaser and Strauss, 1967). This means until (a) no new or relevant data seem to emerge regarding a category, (b) the category is well developed in terms of its properties and dimensions demonstrating variations and (c) the relationships among categories are well established and validated. Unless a researcher gathers data until all categories are saturated, the theory will not be evenly developed and it will lack density and precision.

#### **4.6 Conclusion**

In this chapter major areas of study have been covered, the philosophical and practical aspects of methodology selection when embarking upon empirical research. The interpretive approach and the research methods chosen for this study were described and the justification for choosing mixed methodology approach was discussed. The chapter has presented the research design and the data sources that showed how they

contributed to the achievement of the research objectives. The limitation of research methods chosen was discussed. It has also presented and discussed grounded theory as a practical tool for analysing qualitative data and the reasons for using grounded theory to analyse the case study data. It concluded with a description of the procedures involved in doing data analysis in grounded theory. This chapter has established the general rationale for the study. The next chapter presents the analysis and findings of the survey questionnaire phase of the research.

## CHAPTER FIVE

### FIELD STUDIES: SURVEY QUESTIONNAIRE

#### Introduction

Chapter 4 evaluated research methods and described the methodology used to provide data to investigate the research problem. This chapter presents the analysis and findings of the survey questionnaire phase of the research. The second phase was carried out using multiple case studies (presented in chapter 6) to enable the author to elicit qualitative information to complement the shortcomings of the survey. The results of the questionnaire were analysed using the statistical package for social science (SPSS for windows version 10.1). The survey design was described in chapter 4. The analysis, result and the discussions of the survey are presented.

#### 5.1 Background summary of respondents

A brief background summary of the responding SMEs is presented first to put the data within a meaningful context. A postal questionnaire was sent to a random sample of 400 SMEs. The questionnaire covered a range of pertinent issues including respondents' demographic information, current Internet usage, Internet benefits and barriers preventing the use of the Internet in business. A total of 92 usable responses were received giving a response rate of (23%). Out of these, 26 provided their names and a contact point and indicated a willingness to participate in the follow-up interviews of the next phase of the research. Respondents came from a wide variety of backgrounds (62%) of the respondents were in management roles (including business owners, partners, managing directors, managers and directors) and (20%) were IT/MIS professional including (technical support) while (13%) accounted for other roles in the company.

The participating SMEs covered a broad range of business types, this broad pool of respondents allowed the author to look at Internet use in a wide range of business activities. Less than one quarter (21%) identified themselves as primarily manufacturing companies, (8%) were in construction, and (26%) were in other business, while (13%) were primarily in service businesses. Participants were asked to

indicate the number of employees and their annual turnover. More than half (55%) of the respondents were medium-sized business with more than 50 and less than 250 employees while (45%) were small businesses with less than 50 employees. 20% of companies had an annual turnover of greater than £1,000,000 while (54%) had an annual turnover greater than £5,000,000. Table 5.1 shows the demographic profile of the survey respondents.

Table 5.1 demographic profile of respondents

<i>Role</i>	Number of SMEs	Percentage of sample
Manager	26	28.3
Director/Managing director	25	27.2
Business analyst/IT/MIS/Technical support	18	19.6
Other	12	13
Owner/Partner	6	6.5
<i>Business activity of responding SMEs</i>		
Other	24	26.1
Manufacturing	19	20.7
Financial services/service industries	12	13
Wholesale/retail	8	8.7
Construction	7	7.6
Hospitality/restaurant	4	4.3
Telcommunications/IT	3	3.3
Health/medical	3	3.3
Transport/storage	3	3.3
Mining/quarrying	3	3.3
Utilities (electricity/Gas/Oil/Water)	2	2.2
<i>Number of employees in responding company</i>		
10-49	29	31.5
200-250	20	21.7
50-99	16	17.4
100-149	11	12
1-9	9	9.8
150-199	2	2.2
<i>Annual turnover of responding companies</i>		
Greater than £5000,000	40	57.1
£1000,000-£5000,000	15	21.4
£100,000-£500,000	3	4.3
£500,000-£1000,000	3	4.3
£50,000-£100,000	1	1.4
Less than £50,000	1	1.4

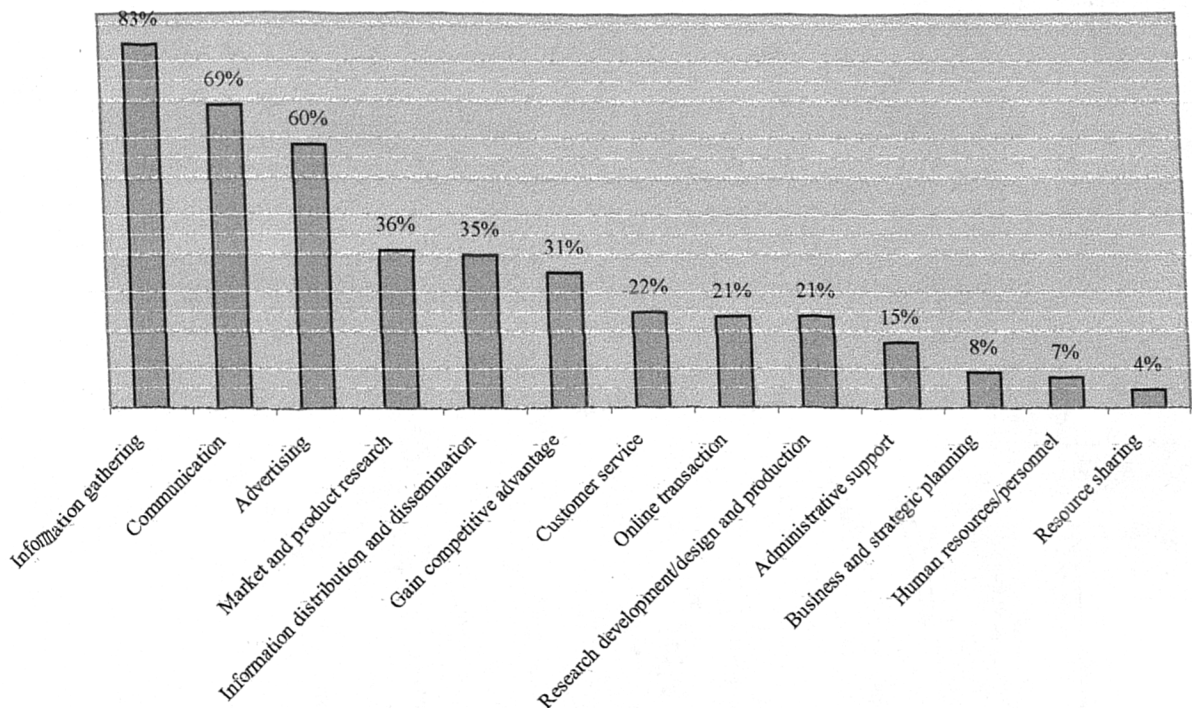
Source: (analysis of survey data, 1999)

## 5.2 Analysis of the survey questionnaire

### 5.2.1 Internet use in SMEs

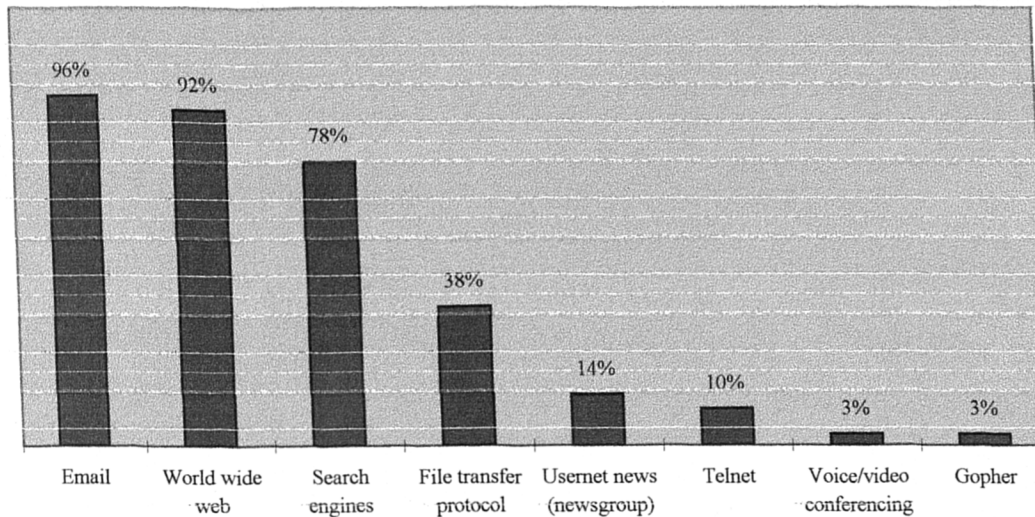
This section looked at ways in which SMEs used the Internet and the type of Internet resources they used. Uses included dealing with customers and suppliers, internal and external uses. Respondents were asked if they used the Internet in their business and what they used the Internet for. The result of the survey showed that (79%) of the SMEs surveyed used the Internet in their businesses while (21%) were non-users. The results indicated that the use of the Internet for information gathering (83%) was more widespread than any other aspect of Internet use in this survey. However, the use of the Internet for communication (69%) (including email within and outside company) and advertising (60%) do not lag far behind. Figure 5.1 provides the breakdown of the main use of the Internet among the surveyed SMEs.

Figure 5.1 Main use of the Internet among surveyed SMEs



Respondents were asked about the resources they use in their organisation. The resources most used were email and web (96%) and (92%) respectively. 78% used search engines and (38%) used FTP (see figure 2 for the resources most used in business).

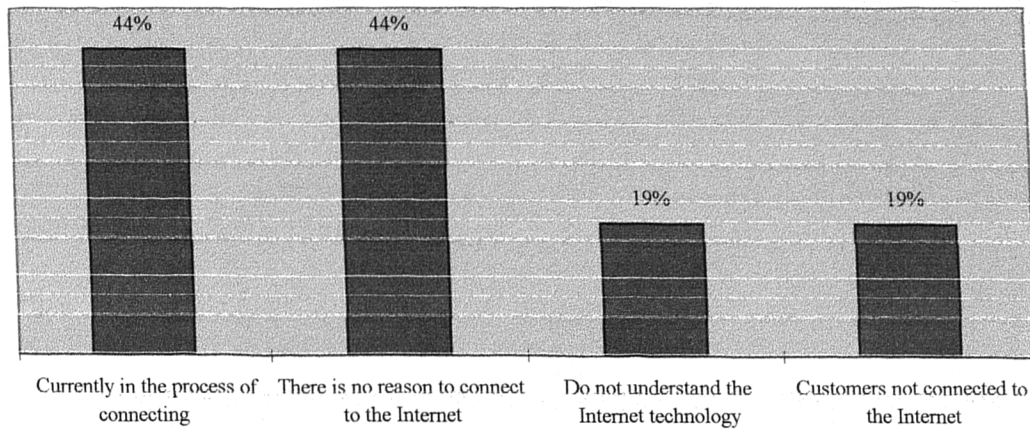
Figure 5.2 Internet resources used most in business



Those respondents that did not use the Internet in their business were asked for reasons why they did not use the Internet. The most common reasons given for not using the Internet were that they had no reason to connect to the Internet (44%). Some indicated that they were currently in the process of connecting to the Internet (44%). 19% of respondents indicated that they don't understand Internet technology while another (19%) indicated that customers were not yet connected to the Internet (see figure 5.3 for the reasons given for not using the Internet in business).



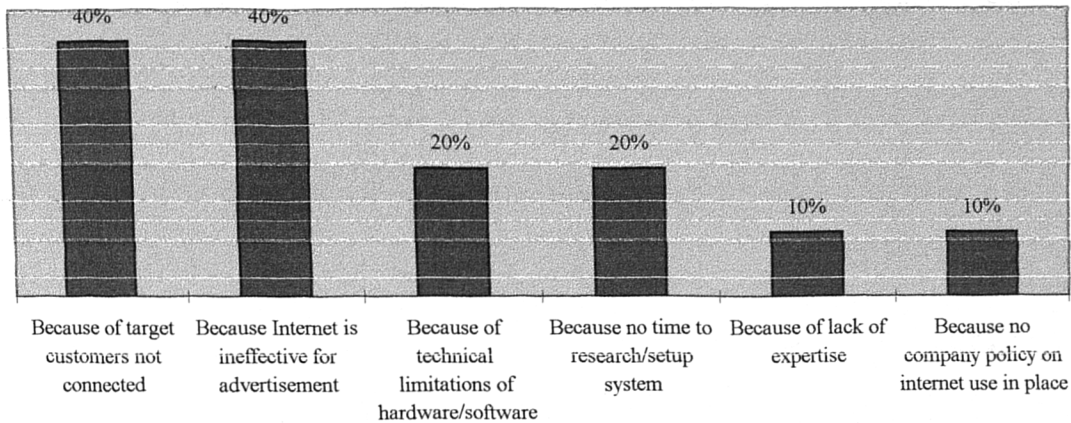
Figure 5.3 Reasons for not using the Internet



Respondents were asked if their companies used the Internet for advertising/marketing. Those SMEs that used the Internet for marketing were asked which methods were used (e.g. mailing lists and www). They were also asked how important the use of the Internet was for advertising/marketing and how effective advertising/marketing effort had been in terms of increase in product sales and profit. Those SMEs that did not use the Internet to market their products or services were asked why they did not use the Internet for advertising/marketing. More than two thirds of SMEs surveyed (77%) engaged in marketing on the Internet and (84%) of those did so via a web site. Nearly half of the respondents that used the Internet for advertising/marketing indicated that using the web to advertise their products or services was quite important for their business success (46%). One third of those that used the Internet for marketing felt it had been effective in terms of increase in product sales.

When asked if advertising/marketing of products or services on the Internet had been effective in terms of increase in profit. Only (11%) of the respondents felt that advertising or marketing on the Internet had been effective in terms of increase in profit. The most common reasons given for not using the Internet to advertise/market products or services were target customers not connected to the Internet (40%) and they did not believe that the Internet was effective for advertising/marketing (40%). Figure 5.4 shows the reasons for not advertising/marketing on the Internet.

Figure 5.4 Reasons for not advertising on the Internet



One question was asked about the importance of the Internet to companies' competitiveness. There was a wide range of responses, (41%) of respondents indicated that the use of the Internet was "not very important" or "not at all important" to their competitiveness. 56% indicated that the use of the Internet was "essential" or "very important" in their competitiveness. They were asked overall, how effective has the Internet been in meeting their company's needs? In terms of marketing their products/services, communication (e.g. using email within and outside the company) and competitiveness (e.g. gained competitive advantage over their competitors). 43% felt that the Internet had been "very effective" or "effective" in meeting their company's needs in marketing their products/services to the global audience. Over half the respondents felt "neutral" while (11%) felt that the Internet had been "ineffective" or "very ineffective in meeting their company's marketing needs. Over three-quarters (78%) of all the respondents indicated that the Internet had been "very effective" or "effective" in meeting their company's communication needs while (18%) indicated "neutral". On the other hand just a quarter (25%) indicated that the Internet had been "very effective" or "effective" in meeting their competitive needs.

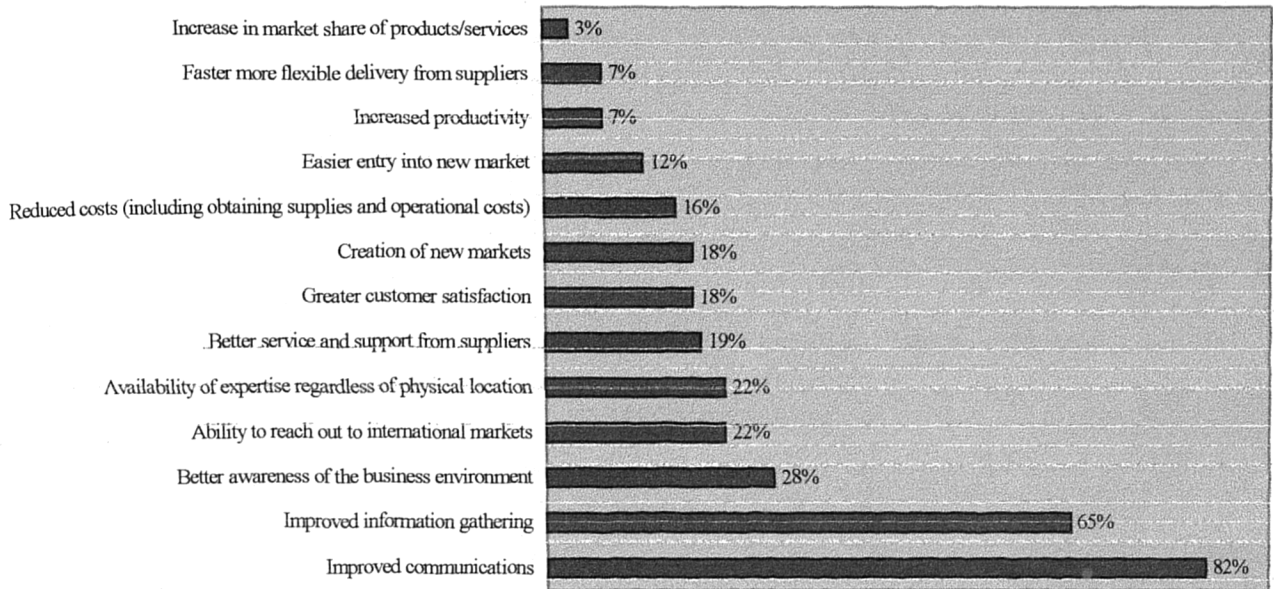
Respondents were asked about their views on the potential of the Internet. 40% of the respondents agreed that SMEs were aware of the benefits they could achieve through the use of the Internet and its technologies (e.g. web, email, etc). 40% agreed that the Internet allows easier entry into traditionally hard access markets, due to less expensive product promotion, and new sales channel. 37% agreed that inter-business

collaboration between SMEs would increase. 48% agreed that internal company communication would improve as a result of Internet use. 38% agreed that the Internet helps companies to differentiate themselves from other companies through product innovation, creation of new products or customising existing products in an innovative way. 45% agreed that there would be a lot of potential business opportunities for SMEs in overseas market. 47% agreed that foreign competition for SMEs traditional market would increase.

### **5.2.2 Benefits**

This section asked about the benefits the respondents had gained from the use of the Internet. The benefits listed were in the areas of greater customer satisfaction, increased market share, improved communication, ability to reach out to international markets and reduced costs. Respondents were asked to indicate the benefits their companies had gained from the use of the Internet. Over half of all the respondents (82%) indicated that improved communications were the most common benefits gained from the use of the Internet, followed by improved information gathering (65%). Figure 5.5 shows the breakdown of benefits gained from using the Internet.

Figure 5.5 Benefits of using the Internet



### 5.2.3 Barriers

This section asked about the importance of a number of current issues hindering SMEs from using the Internet. Nearly all the issues listed below were selected as "very important" or "important" by more than half of the respondents, except lack of universal electronic payment systems (41%) and concern on how to tax and collect taxes over the network (59%), where respondents indicated "not important" to them. Only (7%) of respondents indicated that concern on how to tax and collect taxes over the network was "very important". Table 5.2 shows the breakdown of the barriers hindering Internet use.

Table 5.2 Barriers hindering Internet use

<i>Barriers hindering Internet use</i>	<i>Very important</i>	<i>Important</i>	<i>Not important</i>
<i>Unauthorized access to network</i>	55 (48%)	12 (16%)	5 (5%)
<i>Privacy of information is guaranteed</i>	49 (67%)	20 (27%)	3 (4%)
<i>System reliability (available when you need it)</i>	46 (63%)	23 (32%)	2 (2%)
<i>Tampering with network messages</i>	46 (63%)	20 (27%)	6 (8%)
<i>Contract negotiation made over the Internet are enforceable</i>	32 (44%)	23 (31%)	14 (19%)
<i>Lack of copyright protection</i>	14 (19%)	36 (49%)	22 (30%)
<i>Lack of universal electronic payment system</i>	9 (12%)	31 (43%)	30 (42%)
<i>Concerned on how to tax and collect taxes</i>	5 (7%)	21 (29%)	43 (59%)

Source: (analysis of survey data, 1999)

### **5.3 Discussion of the survey findings**

The findings are discussed based on the six main categories that emerged from the survey: current Internet usage in SMEs, Internet as a medium of communication, Internet as an advertising and marketing tool, Internet as a competitive tool, benefits of using the Internet, and barriers hindering the use of the Internet. In an attempt to better understand the pattern of Internet usage that has emerged from the survey, the respondents were grouped between medium and small businesses and the number of employees was used as a dividing point to classify them into these two groups. These two groups included 50 medium and 42 small businesses giving total usable questionnaires of 92, a response rate of (23%). They were then examined according to their Internet usage in order to ascertain if the size of a firm influences the adoption and use of the Internet in SMEs.

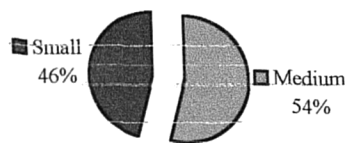
#### ***5.3.1 Current Internet usage in SMEs***

Internet use by the companies' surveyed was (79%) and (21%) were non-users, (44%) of non-users indicated that they were in the process of connecting to the Internet. The number of companies with their own web site was (81%) and (19%) had no web sites. The main uses of the Internet were information gathering and communication with relatively few SMEs using the Internet for human resources and strategic planning. The main Internet resources used most by SMEs were email (96%) and the web (92%). 78% of SMEs used the Internet to search and access information generally. This finding is very much in line with the D'I1 (1998) survey which found that many of the SMEs interviewed indicated that use of external email in this was one of the ways that ICTs have had a significant impact on their business. Similarly, Poon and Strom (1997) found that external e-mail (89%) was one of the main uses of the Internet in their study, followed by information research (58%) and advertising /promoting the business (50%). The present survey showed that almost half of those who have Internet access also used e-mail for internal communications. The reason why e-mail was so much embraced compared to other Internet applications was the asynchronous communication ability and the documentary record of action.

The survey findings showed that over half of the responses (54%) came from medium-sized companies with more than 50 employees while (46%) of responses came from small companies with less than 50 employees (see figure 5.6). The survey

indicated that smaller businesses were half as likely to be connected to the Internet as medium businesses, with those not connected largely feeling that they had no real use for it. 44% of SMEs not connected felt that the Internet was simply not relevant to their work or could not assist their business. The result showed that other factors do seem to discourage SMEs from connecting, in particular, lack of understanding of Internet potential in business. This is consistent with the findings of Oftel (2000) which found that a possible barrier to Internet use was lack of knowledge of the equipment needed and how to use it. The survey indicated that (31%) of small businesses could not spare the time to learn how to use the Internet. The Oftel survey concluded that the main reasons for not using the Internet remained that it was not relevant to the work of the business (mentioned by 53%) and that the Internet could not assist the business in any way (52%).

Figure 5.6 percentage of respondents by company size



Considering medium and small businesses separately, the survey showed that there were slightly different levels of Internet usage in each of these groups. Large proportions of SMEs using the Internet (59%) were medium-sized companies with over 50 to less than 250 employees, while (41%) were small companies with 1 to 49 employees. 63% of medium-sized companies have web sites while (37%) of small companies have web sites. 51% of medium-sized companies advertise on the Internet while (26%) of small companies advertise on the Internet. Table 5.3 shows the breakdown between medium and small businesses and the main uses of the Internet. The first column of the table identifies the categories under examination; the second and third columns list the number of responses and percentage of each category for medium and small firms, respectively.

Table 5.3 Main use of the Internet by Company size

<i>Main uses of the Internet</i>	<i>Medium</i>	<i>Small</i>
<i>Information gathering</i>	37 (51%)	23 (32%)
<i>Communication (including email, within or outside the company)</i>	31 (43%)	19 (26%)
<i>Advertising</i>	27 (38%)	16 (22%)
<i>Market and product research</i>	16 (22%)	10 (14%)
<i>Information distribution and dissemination</i>	16 (22%)	9 (13%)
<i>Gain competitive advantage</i>	13 (18%)	9 (13%)
<i>Customer service</i>	8 (11%)	8 (11%)
<i>On-line transaction</i>	6 (8%)	9 (13%)
<i>Research development design and production</i>	13 (18%)	2 (3%)
<i>Administrative support</i>	5 (7%)	6 (8%)
<i>Business and strategic planning</i>	5 (7%)	1 (1%)
<i>Human resources personnel</i>	4 (5%)	1 (1%)
<i>Resource sharing</i>	-	3 (4%)

Source: (analysis of survey data, 1999)

Analysing the data according to company size showed that information gathering was the most cited use by all companies surveyed (83%). 51% for medium-sized companies and (32%) for small companies, followed by communication (43%) for medium-sized and (26%) for small companies. The differences between the activities of small and medium businesses were significant with the exception of small businesses being more likely to use the Internet for online transaction and medium businesses being more likely to use the Internet to find information on business products or services. Medium-sized companies had higher levels for almost all the activities listed.

The survey result has demonstrated that size of a company influences the adoption and use of the Internet. The findings of a number of recent studies lend support to this result. The recent survey conducted on behalf of Oftel by Continental Research among 700 SMEs comprising 400 small and 300 medium businesses located across the UK, found that (49%) of small businesses were connected to the Internet while (70%) of medium businesses were connected to the Internet (Oftel, 2000).

Similarly, the survey of Internet use by North American businesses (<http://www.ora.com/survey/business> -conducting business on the Internet, 1996, O'Reilly & Associates) found that the proportion of medium sized business (over 100 employees) connected to the Internet was several times greater than that of small companies. Another study carried out by PFA research into the usage and uptake of ICTs by European SMEs cited in DTI (1998), found that there were significantly

different levels of uptake in the use of the Internet between medium and small businesses. For instance, (41%) of companies with 50 employees and over were using the Internet while only (16%) of companies with less than 50 employees use the Internet.

However, these results contrast sharply to other studies (Abell and Lim, 1996; Abell and Black, 1997; Poon and Swatman, 1998) that reported more than (50%) of their sample being composed of micro-sized small firms. Poon and Swatman (1998)'s study of small business Internet commerce experience in Australia, found that many small firms participating in Internet commerce were micro-sized businesses, rather than the more familiar SMEs. The business use of the Internet survey conducted in New Zealand (Abell and Lim, 1996; Abell and Black, 1997) found that smaller companies with less than 50 employees used the Internet the most. The reason for this disparity in both Australia and New Zealand studies may be because all the companies surveyed in their studies were almost considered small in this study (less than 50 employees).

### ***5.3.2 Internet as a medium of communication***

The survey result showed that communication (including email) was the second most used after information gathering. It showed that email was not only the most popular tool for internal and external communication on the Internet, but it was also one of the most popular methods of advertising products and services to millions of people globally. The findings supported others (Ofitel, 2000; Abell and Lim, 1996; Poon and Swatman, 1997; Poon and Strom, 1997; DTI, 1998, 1999) which found email as the Internet service used most in business. Ofitel (2000) found that email was the most common application for the Internet used by (62%) of SMEs, with use of e-mail rising among small businesses. In their study of small business use of the Internet, Poon and Strom (1997) found that the reasons for using the Internet in business were external email (89%). Their results are similar to Abell and Black (1997) which reported that (94%) of their respondents used the Internet to communicate with outside companies. DTI (1998) found that out of the (37%) of SMEs that had Internet access, (65%) used it primarily for email communication.



The widespread adoption of email allows businesses, suppliers and consumers to correspond quickly, easily and perhaps more importantly, cheaply, no matter where in the world they are based. Customer queries can be handled via email and product information can be widely and instantly disseminated via email. Sales people can communicate and share information with headquarters and other members of the sales team via email. Communicating using this method is a low-cost alternative to sending and receiving local information. This strongly supports the notion that low cost of communication plays a critical role in the decision to use the Internet. It has been suggested that the low costs of communicating makes it a low-risk strategy and thus very appealing to SMEs, which lacked the financial resources to use other methods of marketing.

Beyond the cost advantage, is the time advantage also, a message can be sent around the world in minutes, phone tag and busy signals are eliminated. Clarke (1996) indicates that one aspect of the Internet that is beneficial to SMEs is its ability to greatly enhance communication channels and it is available any time for consumers to access supplier information. The study on the emerging issues of small business use of the Internet (Poon and Swatman, 1997) shows that most small businesses are predominantly using the Internet as a communication medium. The growth of email access has opened up opportunities for companies to look at different ways of direct marketing or communicating directly with customers.

Analysing the data according to company size (see table 5.3 above) showed that (43%) of medium-sized companies used communication compared to (26%) of small companies. The use of email was more prevalent in medium-sized companies than in small companies; this is probably due to the fact that medium-sized companies have more internal communication issues than small organisations. While small companies may derive benefits from having an external email service, the benefits of having an internal email system were fewer for small companies, because of their size. Furthermore, analysing the comments from the questionnaires, the majority of respondents indicated that communicating over the Internet did not totally eliminate other means of communication (such as telephone or fax). They indicated that the use of the Internet for communication was regarded as an additional means of communication, rather than a substitute.

### **5.3.3 Internet as an advertising and marketing tool**

More than three quarters of SMEs surveyed (77%) engaged in marketing on the Internet and (84%) of those did so via a web site. Out of these (51%) were medium while (26%) were small businesses. Nearly half (46%) of the respondents that used the Internet for advertising/marketing indicated that using the web to advertise their products or services was quite an important part of their advertising and marketing effort. This is similar to the finding of CommerceNet (1999) of UK Internet survey, which found that (40%) of respondents indicated using their web sites for advertising. DTI (1998) found that (47%) use their web sites for advertising and marketing, about (10%) for sales and (26%) for purchasing. Increasingly companies are using their presence on the Internet to allow them to sell their products and services on-line, (13%) of those UK companies with web sites are now using them for this purpose. The number of UK companies with web sites have grown from (27%) to (37%) since the last survey in 1997 according to DTI (1998). The web is viewed as one of the benefits that the Internet can offer to SMEs particularly small companies that cannot afford to develop their business abroad through traditional channels.

Many of those SMEs that used the Internet (29%) felt it had been effective in terms of product sales and only (11%) felt it had been effective in terms of an increase in profit. However, most of them commented that they were not sure of the effectiveness of the Internet for marketing as the only evaluation method was keeping track of costs. This is not surprising as methods for measuring the effectiveness of the Internet are only just starting to appear (Poon and Swatman, 1997). Those SMEs that did not use the Internet to market their products or services were asked for reasons why they did not use the Internet for advertising/marketing. The main reasons given (mainly small businesses) was because target customers were not connected to the Internet (40%) and advertising on the Internet was ineffective (10%) for medium businesses, (30%) for small businesses (see table 5.4). The results suggested that expectations concerning business objectives related to sales and profits were not met, as indicated by a low percentage of respondents. This is in contrast to the earlier hype and speculation in the business literature and media reports (Cronin, 1994) that the Internet would help companies to advertise their products or services and achieve global exposure which would lead to increases in sales and profitability.

Table 5.4 Reason for not using the Internet for advertising/marketing by company size

<i>Advertise on the Internet</i>	<i>Medium</i>	<i>Small</i>
<i>Because of target customers not connected</i>	-	4 (40%)
<i>Because Internet is ineffective for advertisement</i>	1 (10%)	3 (30%)
<i>Because of technical limitations of hardware software</i>	2 (20%)	-
<i>Because no time to research setup system</i>	1 (10%)	1 (10%)
<i>Because of lack of expertise</i>	1 (10%)	-
<i>Because no company policy on internet use in place</i>	1 (10%)	1 (10%)

Source. (analysis of survey data, 1999)

### 5.3.4 *Internet as a competitive tool*

The importance of the Internet to SMEs' competitiveness was fairly high. Over half of the respondents indicated that the Internet was important to their competitiveness: (56%) indicated 1, 2 or 3 on a scale ranging from 1 to 5, with 1 being essential and 5 being not at all important. The survey results showed that more medium-sized businesses regarded the Internet as an essential competitive tools (60%) than the small companies (50%). Medium-sized companies saw themselves in a more competitive environment than the small businesses. A possible explanation for this difference could be because medium-sized companies are more likely to have the financial capability to invest in Internet technologies whilst small companies are more wary of committing their funds. The difference in attitude is related to the fact that small companies tend to be less aware of the benefits that can be derived from investing in information technology.

The DTI (1998) findings lend support to the importance of the Internet to SMEs' competitiveness. The survey found that (39%) of the UK SMEs see information and communication technologies (ICTs) as having a 'key impact' on competitiveness and (86%) of employees in the UK recognise that the use of ICTs is important for competitiveness. It pointed out that effective use of ICTs is likely to be a major determinant of competitive advantage in the 21<sup>st</sup> century. The DTI survey identified three ways that the use of ICTs can have a positive impact on competitiveness: (1) it can improve efficiency and allow processes to be streamlined by reducing the time and effort required for communicating and processing information. (2) it can improve responsiveness and shorten delivery times by enabling the transformation of business processes and by assisting in organisational change and (3) it can allow the development of new products and services, opening up new business opportunities.

Conducting business on the Internet provides SMEs with unparalleled opportunity to reach distance markets (Abell and Black, 1997). The use of the Internet can be a double-edged sword, while it may enhance SMEs positions by lowering transaction costs and extending their geographic reach, it may marginalise their business as geographic barriers to entry fall for new global competitors who may move in to take a part of their market share. In addition, there is the danger that the use of the Internet in relation to global marketing can be a competitive threat to SMEs. They are more vulnerable to the competitive and financial vulnerabilities of their industries.

Behrendorff and Goldsworthy (1996) show that SMEs exhibit some fear that their products and services may be easily copied and perhaps more cheaply produced by an overseas competitor if they are advertised on a global basis to the world at large. On networks like the Internet, the problems are compounded by the ease in which files can be mounted on bulletin boards and illegally copied to multiple sites at almost no cost to the perpetrator.

#### ***5.3.5 Benefits of using the Internet***

The result showed that the highest benefits gained from the use of the Internet were improved communication (82%) followed by improved information gathering (65%) and better awareness of business environment (28%), availability of expertise regardless of physical location (22%) and ability to reach out to international markets (22%). The improved communication and information gathering benefits of using the Internet have been repeatedly suggested by the literature as especially important for SMEs (Auger and Gallagher, 1997). In fact, the result showed that these categories were important for the surveyed SMEs. In addition, the result indicated that the wider reach of the Internet was also very important in the decision to use the Internet. It showed that SMEs perceived the Internet as a new and innovative method of promoting their products. This finding is very much in line with other studies, such as DTI (1998), Abell and Lim (1996), Riemenschneider and Mckinny (1999).

Riemenschneider and Mckinny (1999) found in their study that the benefits of using the Internet were in the areas of improved communication, improved information accessibility, enhanced distribution of information, and increased speed in getting tasks completed. In addition, the analysis of e-commerce practice in SMEs survey carried out by Chappell and Feindt (1999) also found that the highest benefit of e-

commerce was as access to new markets (72%) followed by improved customer relations (71%) and new ways of marketing (67%).

When results were broken down by company sizes, the differences between small and medium companies were apparent, with the most uses and benefits claimed by medium-sized companies. As can be seen from table 5.5, the largest proportion of responses was from medium-sized companies. The results also indicated that the improved communication, information gathering, and better awareness of business environment benefits of the Internet were considered more important in the decision to go on-line for medium businesses than for smaller businesses. The result showed that medium companies used the Internet in more ways, gained more benefits from its use, and were more likely to use it for other business activities. There was no evidence from the survey to support the claims that small companies were able to reap more significant benefits from the use of the Internet than their larger counterpart as reported by Abell and Black (1997).

Literature reveals (Hamill and Gregory, 1997) that many SMEs participating in the Internet commerce activities do so in the hope of achieving marketing benefits, better global exposure and customer relationships. The survey results showed that most SMEs viewed the Internet as a reach tool to advertise products and services to the global audience and increase sales, rather than to restructure their business. The Internet was viewed as a tool to extend the successful use of existing computer-based tools. It was seen as a useful means to efficiently implement inter-organisational links, and participate in the global market place.

Table 5.5 Benefits of using the Internet by company size

<i>Benefits of using the Internet</i>	<i>Medium</i>	<i>Small</i>
<i>Improved communications</i>	34 (50%)	22 (32%)
<i>Improved information gathering</i>	30 (44%)	14 (21%)
<i>Better awareness of business environment</i>	15 (22%)	4 (6%)
<i>Ability to reach out to international markets</i>	11 (16%)	4 (6%)
<i>Availability of expertise regardless of physical location</i>	8 (12%)	7 (10%)
<i>Better service and support from suppliers</i>	8 (12%)	5 (7%)
<i>Greater customer satisfaction</i>	4 (6%)	8 (12%)
<i>Creation of new markets</i>	8 (12%)	4 (6%)
<i>Reduced costs (including obtaining supplies, operational cost etc)</i>	3 (4%)	6 (9%)
<i>Easier entry into new markets</i>	4 (6%)	4 (6%)
<i>Increased productivity</i>	4 (6%)	1 (2%)
<i>Increase in market share of products services</i>	1 (2%)	1 (2%)

Source: (analysis of survey data, 1999)

### **5.3.6 Barriers hindering the use of the Internet**

Despite the benefits and opportunities available from the use of the Internet, it still has a number of limitations and misconceptions that must be overcome before it can be deemed suitable for commerce especially concern for privacy and security of information on the Internet. The result showed that the majority of SMEs expressed concern about security of information as a major problem and in certain respects as an obstacle to using the Internet for conducting business. Security issues were expressed in terms of privacy of information, tampering with network messages and unauthorised access to network. Other barriers included the reliability of network system (e.g. available when you need it and speed of access) and difficulty of finding information due to volume. This is important as it contrasts with the high value placed on Internet use for information gathering.

The majority of SMEs indicated that security of information was the main issue that needed to be tackled, if the use of the Internet for business transaction was to become widespread. A significant number of respondents agreed that lack of confidence in Internet transactions by customers and lack of protection when buying goods and the unclear liability issues were possible barriers hindering the wide spread use of the Internet. Chappell and Feindt (1999) found in their study of analysis of e-commerce practice in SMEs that (64%) of respondents cited cost of investment as a barrier to using e-commerce, (57%) cited infrastructure and (56%) security of information. Similarly, DTI (1998) survey showed that security of transaction was felt to be a major inhibitor to purchasing goods and services over the Internet. It showed that (69%) of respondents cited fears over security as a main barrier to purchasing, despite the fact that there were now a number of secure methods for transferring funds.

Riemenschneider and McKinny (1999) indicated that the obstacles cited in their study were: high costs to set up and maintain the Internet, reduced security of information, limitation of personal contact with the customer, and concern over competitors having access to technical information and technical knowledge. Oftel (2000) survey found that lack of knowledge of computer equipment and cost of equipment were a deterrent to businesses connecting to the Internet. In addition, the SMEs that were not connected to the Internet but were likely to do so in the next 12 months were asked why they had not connected so far. The most common responses were that they had

no need for it/were not interested; that they have not had the equipment/computers until now, and that they just hadn't got round to it/hadn't had time (Ofiel, 2000).

However, it must be acknowledged that SMEs face particular problems in adopting Internet technology. They have limited access to both information and expertise in the area of e-commerce. The initial costs of the technology were also regarded as a problem (<http://www.johnmcguinness.com/ecommerce.html>). A recent survey by the OECD found that the most significant barriers to e-commerce among SMEs appeared to be a lack of awareness of e-commerce and uncertainty about its benefits. According to the OECD survey, the most significant barriers for SMEs in OECD countries were: uncertainty about its benefits for their business; security of information; the complexity and cost of electronic commerce; the early stage of development of doing business over the Internet and the lack of a sound legal framework (OECD, 2000).

The concern over competitors having access to technical information as well as the concern over security are possible indicators that many SMEs are not convinced that using the Internet is a sound approach to conducting business. Abell and Black (1997) argue that the continuing concerns over security and technical problems can hamper companies' plans to use the Internet. Chappell and Feindt (1999) suggest that most of the barriers to e-commerce are problems of perception, rather than real obstacles. Bloch and Segev (1996) argue that customer perceptions are really what matters in terms of new technology adoption. Customers concern with privacy and security could lead to a backlash against suppliers conducting business on the Internet, or simply customers may avoid the use of the Internet for business transactions. There was however, no evidence in this survey of how many people had been put off from using the Internet by concerns over security.

Comments from the questionnaire indicated that lack of an evaluation method to quantify benefits and insufficient understanding of the Internet and its technologies were the main obstacles hindering most SMEs from using the Internet. There was also uncertainty as to the robust nature and longevity of the existing infrastructure. The DTI survey indicated that speed was another significant problem with (50%) of people interviewed dissatisfied with how long it take to download pages with

graphics. The existing telecommunication infrastructures are slow to warrant full-scale commerce on the Internet (DTI, 1998).

#### **5.4 Classification of SMEs according to Internet usage and ownership of web sites**

In an attempt to better understand the pattern that might be in the survey results, SMEs were classified between Internet users with web site and Internet users without web sites. This classification was necessary to enable comparison between SMEs that use the Internet and have web sites and SMEs that use the Internet but do not have web sites. The reasons for classification were, first, the researcher chose having an Internet account as a basis for separating users from non-users because having an Internet account is the first step a firm must take before it can actually use the Internet. Second, the researcher thought that it was important to distinguish the Internet users with web sites from those Internet users without web sites because the web, through the user-friendly browsers has contributed significantly to the growth of the Internet. Furthermore, such classification may also give an indication of the pattern and level of Internet usage between medium and small businesses.

Out of the 92 SMEs that participated in the survey, (79%) have an Internet account and are called users of the Internet, while those that did not use the Internet are considered non-Internet users. Out of those who have access to the Internet or Internet users, (81%) have a web site while (19%) have no web site. Table 5.6 shows the cross tabulation of the main use of the Internet, the Internet resources used and the benefits of using the Internet. The first column of the table identifies the categories under examination, the second and third columns shows SMEs Internet use with web site and Internet use without web sites. It lists the number of responses and percentage of each category for the two groups.



Table 5.6 Cross tabulation of Main use of the Internet by Internet Web site; Internet resources by Internet Web site; and Benefits by Internet Web site

<i>Internet main use:</i>	<i>SMEs Internet use with web site</i>	<i>SMEs Internet use without web site</i>
<i>Information gathering</i>	48 (67%)	12 (17%)
<i>Communication</i>	37 (51%)	13 (18%)
<i>Advertising</i>	43 (58%)	-
<i>Market and product research</i>	22 (31%)	4 (6%)
<i>Gain competitive advantage</i>	20 (28%)	2 (3%)
<i>Information distribution</i>	19 (26%)	6 (8%)
<i>Customer service</i>	15 (21%)	1 (1%)
<i>Research development</i>	13 (18%)	2 (3%)
<i>On-line transaction</i>	10 (14%)	5 (7%)
<i>Administrative support</i>	8 (11%)	3 (4%)
<i>Business and strategic planning</i>	4 (6%)	2 (3%)
<i>Human resources personnel</i>	3 (4%)	2 (3%)
<i>Resource sharing</i>	3 (4%)	-
<b><i>Internet resources used:</i></b>		
<i>Email</i>	57 (81%)	13 (19%)
<i>World wide web</i>	55 (79%)	12 (17%)
<i>Search engines</i>	46 (66%)	11 (16%)
<i>File transfer protocol</i>	22 (31%)	6 (9%)
<i>Usenet news (Newsgroup)</i>	6 (9%)	4 (6%)
<i>Telnet</i>	6 (9%)	1 (1%)
<i>Voice video conferencing</i>	2 (3%)	-
<i>Gopher</i>	-	2 (3%)
<b><i>Benefits of using the Internet:</i></b>		
<i>Improved communication</i>	45 (66%)	11 (16%)
<i>Improved information gathering</i>	37 (54%)	7 (10%)
<i>Better awareness of business</i>	14 (21%)	5 (7%)
<i>Ability to reach out to international markets</i>	14 (21%)	1 (2%)
<i>Availability of expertise regardless of physical location</i>	12 (18%)	3 (4%)
<i>Better service and support from suppliers</i>	8 (12%)	5 (7%)
<i>Creation of new markets</i>	12 (18%)	-
<i>Greater customer satisfaction</i>	9 (13%)	3 (4%)
<i>Reduced cost (including obtaining supplies, operational costs etc)</i>	8 (12%)	3 (4%)
<i>Easier entry into new markets</i>	8 (12%)	-
<i>Increased productivity</i>	2 (3%)	3 (4%)
<i>Faster more flexible delivery from suppliers</i>	-	2 (3%)
<i>Increase in market share of products services</i>	2 (3%)	-

Source: (analysis of survey data, 1999)

The cross tabulation between Internet usage and ownership of web sites showed that SMEs with web sites were more active users of the Internet than those without web site. They used the Internet to advertise or provide information to the public. It showed that nearly all the SMEs that used the Internet and had a web site used it to advertise their products to a global audience. In contrast, SMEs without a web-site were in the earlier phases of Internet usage and used the Internet to obtain information rather than provide information or conduct transaction. The next section highlights

findings from two surveys on Internet usage in the UK and compares it with the present survey.

### 5.5 Comparison of this survey with other surveys conducted in the UK

There are a growing number of studies such as Georgia Institute of Technology's Graphic, Visualisation, and Usability Centre (GVU, 1994-1999) that attempt to quantify individual consumer use of the Internet by gender and age, purchasing preference etc. There are a few recent surveys, which provide some data on general usage pattern in the UK. The survey conducted by Spectrum on behalf of the Department of trade and industry (DTI, 1998, 1999) compared UK usage of ICTs with the four developed economies of Germany, France USA and Japan. Another recent survey conducted on behalf of Oftel by Continental Research (2000) amongst 700 SMEs comprising 400 small and 300 medium businesses located across the UK. These surveys are presented to enable comparison to the present survey findings. Table 5.7 shows the summaries of the DTI and Oftel survey findings.

Table 5.7 summaries of Spectrum (DTI, 1998) and Continental Research (Oftel, 2000) surveys

<p><b><i>Spectrum (DTI, 1998) survey on SMEs and the Internet</i></b> The DTI commissions an annual survey on ICT adoption in a number of major economies: France, Germany, Japan and the USA. The survey considers adoption in 100 micro firms (fewer than ten employees), 200 SMEs (10-250 employees) and 200 large firms, questionnaires and some interviews in the UK were used. In the UK 49% of firms (37% of SME's) have Internet access and it is primarily used as an information source by 90% of these and 65% use email. Only 47% use it for advertising and marketing, about 10% for sales and 26% for purchasing. Only 8% of micro firms and 23% of SME's have web sites providing a presence rather than contributing to advertising and marketing. Only 48% of micro-sized companies have PCs with modem and only 15% SMEs use remote access. 39% of UK see ICTs as having a 'key impact' on competitiveness over two years. 86% of employees in the UK now recognises that the use of ICTs is important for competitiveness. 83% of large companies have PCs with modem compared to only 48% of micro-sized companies. 15% of SME's report EDI use and 48% e-mail. This suggests that while the Internet is not used for trading, SME's are using ICT for customer communication. Problems identified include security fears, speed of access, and difficulty in finding information due to volume.</p> <p><b><i>Continental Research (Oftel, 2000) survey on Internet use among SMEs</i></b> The survey was conducted on behalf of Oftel by Continental Research during September 2000 amongst a representative sample of small and medium enterprises (SMEs) in the UK, reflecting the UK profile in terms of business size, sector and region (<a href="http://www.oftel.gov.uk/cmu/research/brint1000.htm">http://www.oftel.gov.uk/cmu/research/brint1000.htm</a>) 49% of SMEs were connected to the Internet, with 19% in the process of connecting and a further 5% likely to get connected over the next 12 months. Small businesses (at 49% connected) were less likely to be connected than medium businesses (at 70%). Within the small business sample, Internet connection appeared lowest among micro-businesses (with 1-10 staff). In contrast, 70% of medium businesses were connected to the Internet with 23% in the process of connecting and 3% likely to get</p>
---

connected in the next 12 months.

Over four-fifths (83%) of medium businesses connected to the Internet and 71% of small businesses felt that they were using the Internet more now than when they were first connected.

The main activities were e-mail and accessing information with relatively few businesses using the Internet for interactive or e-commerce activities such as purchasing, selling or banking.

Email was the most common application for the Internet (used by 62% of SMEs), with use of e-mail rising among small businesses. A third of small and medium businesses used the Internet to surf and access information generally.

Overall, three-fifths of SMEs owned a PC that was regularly used by employees, ranging from 59% of small businesses up to 93% of medium business. Over two-fifths (41%) of small businesses did not have a PC which was regularly used by staff compared with 7% of medium businesses. PC ownership was lowest, at 55%, among micro-businesses. The survey found that lack of knowledge of computer equipment and cost of equipment were a deterrent to use of the Internet.

Barriers to use of the Internet included lack of awareness of information and cost.

Lack of understanding of potential uses and benefits indicating a need for greater information on how the Internet can benefit businesses (42%) and (31%) said that they lacked knowledge on the equipment needed and how to use it. 31% of small businesses said that they could not spare the time to learn how to use the Internet. Both the cost of equipment (mentioned by 23% of this group) and costs of subscribing/call charges (22%) had discouraged small businesses from connecting.

The main reasons for not using the Internet remained that the Internet was not relevant to the work of the business (mentioned by 53%) and that the Internet could not assist their business in any way (52%).

Source: (DTI, 1998 and OfTel, 2000)

The major uses of the Internet in these surveys were information gathering and email communication with customers and to indicate a market presence with most SMEs having a web site. The DTI survey found that (37%) of SME's have Internet access and it was primarily used as an information source by (90%) and of these (65%) used it for email. 47% used it for advertising and marketing and only about (10%) for sales and (26%) for purchasing. Internet access for SMEs has grown from (27%) in 1997 to (44%) according to the DTI survey of (1999). The DTI survey also reported that SMEs in the UK have seen strong growth in the ownership and usage of ICTs. This growth is destined to continue, underpinned by the low cost of the Internet when compared to other electronic networks and it's availability 24 hours a day, 7 days a week. The OfTel survey found that (49%) of SMEs were connected to the Internet, and the main uses were e-mail and accessing information. Email was the most common application for the Internet (used by 62% of SMEs) and a third of SMEs used the Internet to surf and access information generally with relatively few businesses using the Internet for interactive or e-commerce activities such as purchasing, selling or banking.

The DTI survey revealed that, the majority of SMEs in the survey population were using computers in their business activities. The survey found that (67%) of SMEs

now own PCs, this is similar to Oftel that shows (59%) of small businesses owned a PC that was used regularly by employees and up to (93%) for medium businesses. 41% of small businesses did not have a PC, which was regularly used by staff compared with (7%) of medium businesses. The DTI survey showed that a large number of SMEs and very small companies used the computer primarily to perform tasks such as designing spreadsheets and word-processing, these uses have traditionally been the extent of SME IT usage (DTI, 1999; Cragg and King, 1993). Both web site ownership and the use of web sites to sell on-line by SMEs has more than doubled since 1997, according to the DTI (1999) survey.

There is also a question over the size of firms using the Internet: (52%) of smaller firms indicated that they cannot see the value of ICT. Indeed, the Oftel survey highlighted that small businesses (at 49% connected) were less likely to be connected than medium businesses (at 70%). 31% of small businesses said that they could not spare the time to learn how to use the Internet. Within the small business sample, the Internet connection appeared lowest among micro-businesses (with 1-10 staff). In contrast, (70%) of medium businesses were connected to the Internet. The DTI survey suggests that size is important in adoption of IT, with only (16%) of micro firms using the Internet, while use increases with size. The findings in both DTI and Oftel surveys tend to confirm the proposition in the present survey that the size of a company matters in the adoption of the Internet.

The present survey result showed that security of information remained a major obstacle in the use of the Internet. Similarly, the DTI survey showed that security of transaction was felt to be a major inhibitor to purchasing goods and services over the Internet. It showed that (69%) of respondents cited fears over security as a main barrier to transacting business over the Internet. There was also a lack of awareness by SMEs owners of the capabilities of IT in general. The need to demonstrate benefits from the Internet was a factor in non-users of the Internet. Lack of understanding of potential uses and benefits indicated a need for greater information on how the Internet could benefit businesses. The Oftel survey found the main reasons for not using the Internet remained that the Internet was not relevant to the work of the business (mentioned by 53%) and that the Internet could not assist the business in any way (52%). It also found that lack of knowledge of computer equipment and cost of

equipment were a deterrent to use the Internet. It showed that (31%) of SMEs lacked knowledge on the equipment needed and how to use it. Both the cost of equipment (mentioned by (23%) of this group) and costs of subscribing/call charges (22%) had discouraged small businesses from connecting. Table 5.8 summaries the findings from the compared surveys.

Table 5.8 Survey results on Internet usage

<i>The use of the Internet in SMEs</i>	<i>Continental Research (Ofitel)</i>	<i>Spectrum (DTI)</i>
<i>Internet access:</i> SMEs 79% Medium 59% Small 45%	<i>Internet access:</i> SMEs 49% Medium 70% Small 49%	<i>Internet access:</i> SMEs 37%
<i>Web site access:</i> 81%	<i>Web site access:</i>	<i>Web site access:</i> 23%
<i>Main use of the Internet:</i> Information gathering 82% Communication with customers 69% Advertising/marketing 60%	<i>Main use of the Internet:</i> Accessing information E-mail	<i>Main use of the Internet:</i> Information source 90% Communication (email) 65% Advertising and marketing 47%
<i>Internet resources:</i> Email 96% Web 92% Search engines 78%	<i>Internet resources:</i> Email 62%	
<i>Reason for not using the Internet:</i> In the process of connecting 44% No reason to connect 44%	<i>Reason for not using the Internet:</i> In the process of connecting 19% Internet was not relevant to the work 53% Internet could not assist the business in any way 52% Lack of understanding of potential Uses 42%	
<i>Barriers:</i> Privacy of information is guaranteed 67% System reliability 63% Unauthorized access to network 48% Lack of understanding 19%	<i>Barriers:</i> Lack of knowledge 31% Cost of equipment 23%	<i>Barriers:</i> Security fears 69% Speed of access 50%

Source: (analysis of survey data, 1999. DTI survey 1998 and Ofitel survey, 2000)

The results of this survey phase of the research was extended by inviting SMEs who had previously completed the initial questionnaire to share their experiences of the factors that influence their decision to adopt the Internet in business. The survey phase of this study was designed to collect descriptive data and it made no provision for interaction with SMEs. Its use provided a useful insight of how SMEs currently use the Internet in business. The findings has shown how SMEs used the Internet in business and what tools they used the Internet for, but the survey fell short of addressing why SMEs adopt and use the Internet in business. However, the survey

had raised some issues that needed to be clarified with an interactive approach. Therefore, to provide explanations of the factors that influence SMEs to adopt or not adopt the Internet in their business, the author conducted a multiple case study during June and August 2001 with seven SMEs to elicit qualitative information to complement the shortcomings of the survey. The case study phase of the research was designed to add a richer dimension to the survey data and to further gather additional information, which would help in providing a deeper understanding of the underlying issues regarding the adoption of the Internet in SMEs.

## **5.6 Conclusion**

The chapter has discussed the findings of a survey questionnaire carried out on a sample of small to medium-sized enterprises in the UK. The survey examined some of the issues associated with Internet usage in SMEs. The analysis indicated that among the uses of the Internet, information gathering, communication and advertising were revealed as the most significant according to the surveyed SMEs. Among the categories examined, SMEs cited improved communication, information gathering and better awareness of business environment as the most benefits gained from using the Internet. Most of the SMEs surveyed believed that Internet capability provided a level playing field on which small firms could compete with larger firms. The results of this survey indicated that SMEs who use the Internet in business perceived it as a relatively low-risk, high-reward strategy.

The summary of the findings is shown in table 5.9. It is difficult to draw quantitative conclusions about SMEs and the use of the Internet, partly because, many of the SMEs in the survey had only just started using the Internet in the last 18 months. Despite this, there was evidence that SMEs were already experiencing limited success with the use of the Internet in exposing their products or services to a global audience and reaching new customers. The results demonstrated that Internet usage in SMEs was now widespread and was not confined to particular sectors of industry or business activity.

The Internet was an extremely attractive method for SMEs to expand their markets and reach a global audience. It was seen as an important medium for SMEs to establish and tighten relationships with their suppliers and customers. The Internet

was very useful in gathering information and communicating with suppliers and customers. The use of the Internet for communication (email) was regarded as an additional means of communication, rather than a substitute. It was viewed by majority of SMEs as transforming the way business is conducted, offering competitive edge and a gateway to the global marketplace. The overall attitude of the surveyed companies toward the use of the Internet in their business was positive.

The survey has shown that the use of the Internet had not managed to fulfil the SMEs business objectives of increased sales and profits satisfactorily. The result showed that the claims and the media hype made for SMEs use of the Internet against the reality of Internet usage in organisational settings was not always right, sales increase and profitability were far lower than expected. The survey findings lend support to the earlier studies which revealed that many SMEs participating in Internet commerce activities do so in the hope of achieving marketing benefits, better global exposure and customer relationships (Abell and Lim, 1996; Poon et al, 1996; Hamill and Gregory, 1997). However, fruitful use was being hampered by concerns over security and whether target markets could be reached.

The Internet usage was cross-tabulated with ownership of web sites, the results indicated that SMEs with web sites were more active users of the Internet than those without a web sites. It showed that SMEs with web sites used the Internet to advertise or provide information to the public. In contrast, SMEs without web-sites were in the earlier phases of Internet usage and used the Internet to obtain information rather than provide information or conduct transactions.

Analysis of the survey results revealed that medium-sized companies were the most enthusiastic about the use of the Internet and small companies the most uncertain. This was partly a reflection of the fact that medium-sized companies were more likely to have the financial capability to invest in IT whilst small companies were more wary of committing their funds. The difference in attitude was also related to the fact that small companies tended to be less aware of the benefits that could be derived from a small investment in the Internet technologies. The SME owner played a critical part in the decision on Internet investment and needed to be convinced of the benefits of using the Internet.

The survey results have indicated that the size of a company influences the adoption and use of the Internet. Medium-sized companies had higher levels for almost all the activities listed and they showed a higher level of interest in improving the firm's overall image through the use of the web site, while smaller firms emphasized the importance of increasing sales to a greater degree. The differences between the activities of small and medium businesses were significant with the exception of small businesses being more likely to use the Internet for online transactions and medium businesses being more likely to use the Internet to find information on business products/services. The survey has shown that smaller businesses were half as likely to be connected to the Internet as medium businesses, with those not connected largely feeling that they had no real use for it. Whilst (44%) of SMEs not connected felt that the Internet was simply not relevant to their work or could not assist their business.

The survey was compared with two other surveys carried out in the UK. The DTI and Oftel surveys suggested growing Internet use among SMEs, although smaller businesses were not adopting the Internet as much as medium businesses. This was mainly due to a focus on cost reduction and improving productivity that can be done through more traditional IT. The major uses of the Internet in these surveys were information gathering and email communication with customers and to indicate a market presence with most SMEs having a web site. The Internet resources most used in these surveys were email and the web. The findings from the DTI survey and the Oftel survey were broadly similar, to the present survey. The DTI and Oftel surveys tended to confirm the proposition that size of company matters in the adoption of the Internet.

Finally, the survey results have indicated that while it was more efficient to communicate and access global information this way, it was not yet efficient enough to conduct full commerce due to the limitation of Internet infrastructure and the fear of security of information. The next chapter presents the analysis and findings of case studies of a cross-section of SMEs to help establish a richer view of the Internet usage and the factors that influence SMEs to adopt this phenomenon.



Table 5.9 Summary of survey findings

***Current use of the Internet***

79% of companies surveyed use the Internet, (81%) have web sites. 59% of medium-sized companies use Internet in their business while (41%) of small companies' use the Internet in their business. Over half of responses (55%) came from medium-sized companies while (45%) came from small companies. Most of the SMEs examined in this study were already comfortable with computer technology before they started to use the Internet. Some of them were keen to explore the possible value of Internet technology to their businesses. The Internet is primarily used for information gathering (82%) and communication (68%), with email (96%) and web (92%) as the most used Internet resources. 77% advertised on the Internet and (46%) see their web sites as being quite an important part of their advertising and marketing effort. The Internet is regarded as very important for advertising and marketing products to the global markets. It is viewed as a cost effective means to provide information, advertise products and conduct transactions. It is seen as a good way to reach and test new international markets. SMEs use their web site and email to provide customer support. The web was viewed as a positive development that enhances the usability of the Internet.

***Benefits of using the Internet***

Benefits gained from the use of the Internet were improved communication (82%) and improved information gathering (65%). The ability to reach international markets and potential customers globally was considered beneficial. It provides easy access to a wide variety of useful information resources. The access to a wide variety of information resources was viewed favourably by all the SMEs. Medium-sized companies claimed more benefits and used the Internet more than small business

***Barriers hindering the use of the Internet***

Security issues were highlighted as the main obstacle hindering the use of the Internet. Security of both messages and internal networks were the main concerns of companies surveyed. Most of the issues included tampering with network messages, unauthorised access to internal networks, and difficulty of finding information due to volume.

Source: (analysis of survey data, 1999)

## CHAPTER SIX

### FIELD STUDIES: CASE STUDY ANALYSIS

#### Introduction

Chapter 5 presented the analysis and findings of the survey phase of the research, which was designed to collect descriptive data, although it made no provision for interaction with SMEs, its use provided a useful insight of how SMEs used the Internet in business. This chapter presents the case study phase of the research, which is based on the issues identified in the survey. The aim of the case study is to elicit qualitative information to complement the survey findings. Secondly, to produce in-depth, holistic study (Yin, 1984), giving the reader sufficient contextual and environmental descriptions to allow them to transfer the case studies based on conceptual applicability. The case studies are reported with sufficient detail and precision to allow judgements about transferability. Thirdly to generate theory which is fully grounded in the data (Dey, 1993). Glaser and Strauss (1967) define a grounded theory as being one which is "readily applicable to and indicated by the data, and is meaningfully relevant to and is able to explain the behaviour under study".

The case study focused on the in-depth understanding of the factors that influence SMEs decision to adopt and use the Internet in business. The material in this chapter is drawn from seven separate field studies carried out within the broad tradition of interpretive case study (Zuboff, 1988; Orlikowski, 1991; Walsham, 1993). The case study involved extensive interviewing of key participants (e.g. company owner or manager in each of the SMEs), coupled with the use of documentary evidence such as company reports. The selection of SMEs that participated in this case study, and how the case study was designed and details of research methods were discussed in chapter 4. The primary details of the SMEs that participated in the case study are shown in table 6.1, and appendix 9 contains a summary of each SME. As table 6.1 shows, these SMEs varied in size, and they came from a number of different industries. The chapter is structured as follows. The first section presents the analysis of the SMEs that participated in the case study. This will be followed by the case study results,

describing the experiences of SMEs in the process. The conclusion of the chapter is then presented.

Table 6.1 List of participating SMEs

SMEs	Type of business	Size (employees)	Turnover (£m)	Established
BIL	Peugeot cars franchise holder	20	7.5	1932
BPC	Publishing	25	N/A	1973
SAH	Health care	200	6	1969
MGL	Manufacturer of contract carpets	9	1.7	1972
AL	Manufacturer and seller of educational engineering equipment	40	5 - 7	1960
FP	Specialist flooring manufacturer	110	N/A	1984
CLR	Cigarette paper manufacturer	180	N/A	N/A

Source: (case study data)

## 6.1 Case studies analysis

This section discusses the analysis of the case studies that participated in this study. The discussion in this section draws from Orlikowski (1993), Glaser and Strauss (1967), Eisenhardt (1989), Miles and Huberman's (1984, 1994) and Strauss and Corbin (1990, 1998). Seven SMEs were studied and analysed in turn, a strategy also adopted by Orlikowski (1993). The data analysis process involved identifying patterns in the case study data. These patterns included issues raised repeatedly across interviews, commonly found in Internet commerce activities or opinions, which kept re-appearing. The data were analysed within each case as well as across the cases to detect similarities and compare differences. The initial concepts that emerged in one case context were then contrasted, elaborated, and qualified in the other.

Within the first case, the iterative approach of data collection, coding, and analysis was more open-ended, and generative, focusing on the development of concepts, properties, and relations, and following the descriptions of how to generate grounded theory set out by Glaser and Strauss (1967) and Eisenhardt (1989). The detailed write-up of the cases and all the data generated by interviews, and documentation were examined and coded by focusing on the factors that influence adoption and use of the

Internet in business. Appendix 7 shows sample extracts from two SMEs (AL and BIL) transcripts with the generated codes and categories while appendix 8 shows how grounded theory was applied to these SMEs.

The case data was read and categorised into concepts that were suggested by the data rather than imposed from outside. This is known as open coding (Strauss and Corbin, 1990, 1998) and it relies on an analytic technique of identifying possible categories and their properties and dimensions. Once all the data were examined, the concepts were organised by recurring theme. These themes became prime candidates for a set of stable and common categories, which linked a number of associated concepts. This is known as axial coding (Strauss and Corbin, 1990) and it relies on a synthetic technique of making connections between subcategories to construct a more comprehensive scheme.

The case data were then re-examined and re-coded using this proposed scheme, the goal being to determine sets of categories and concepts that covered as much of the data as possible. This iterative examination yielded a set of broad categories and associated concepts that described the salient conditions, events and experiences associated with adoption and use of the Internet in this first SME case. These initial concepts guided the remaining case study, allowing the process of data collection, coding, and analysis to be more targeted. Following the constant comparative analysis method (Glaser and Strauss, 1967), the initial SME case's experiences were systematically compared and contrasted with the second SME case. This analysis also used Miles and Huberman's (1984, 1994) technique for across-site pattern comparison and clustering that involves matrix displays to compare key events, triggers, and outcomes, see table A.2 in appendix 8.

Data from the second SME case was first sorted into the initial concepts generated by the first SME data. It soon became clear however, that the initial concepts generated by the first SME case did not accommodate some of the findings emerging from the second SME case. Accommodating the second SME case's experiences, led to some important elaborations and clarifications in the emerging theoretical framework, and forced a reconsideration of some of the first SME case's experiences. For example, the category environmental factor did not include a concept of external pressure from

trading partners, as this was not salient in the first SME case. The second SME case's experiences, however, indicated that they started using the Internet because they were pressurised into doing so by their trading partners, which was indeed very relevant in shaping the interpretations and use of the Internet, and substantially influenced their Internet adoption.

The process of comparing and contrasting the SME case data was repeated for the remaining SME cases. Redefining the initial concepts to incorporate considerations of the second SME case's experiences required returning to the first SME case data, and re-sorting and re-analysing them to take account of the richer concepts and more complex relations now constituting the framework. This ability to incorporate unique insights during the course of the study is one of the benefits of a grounded theory approach, an example of what Eisenhardt (1988) labels "controlled opportunism," where "researchers take advantage of the uniqueness of a specific case and the emergence of new themes to improve resultant theory" (Eisenhardt, 1988).

The iteration between data and concepts ended when enough categories and associated concepts had been defined to explain what had been observed at all the SME cases, and no additional data was found, to develop or add to the set of concepts and categories, a situation Glaser and Strauss (1967) refer to as "theoretical saturation". The resultant framework is empirically valid as it can account for the unique data of each SME case, as well as generalise patterns across all the SME cases (Eisenhardt, 1989). The core categories and subcategories that emerged from the analysis are shown in table 6.2.

Precautions were taken to corroborate the interpretations made (Miles and Huberman, 1984; Yin, 1989). Emerging concepts were checked for representativeness by examining them across participants and with multiple methods. Triangulation across data collection methods (questionnaire, interviews, and documentation review) further served to strengthen the emerging concepts. The constant comparative method also requires the searching out and checking of contrasts and negative evidence, hence forcing the confrontation of emerging explanations with possible alternative ones. Finally, having analysed interview transcripts from each of the SME cases, the categories generated provided the basis for constructing a qualitatively rich narrative

description of the adoption and use of the Internet in business. This account was then fed back to the interviewees, who provided commentary, correction, and elaboration on drafts of the findings and conceptual model. The propositions thus developed from the data analysis are presented below.

Table 6.2 Core categories and subcategories that emerged from the data analysis

Core categories	Subcategories	
<b>Technological factors</b>	Compatibility	
	Complexity	
	Cost effectiveness	
	Benefits of using the Internet <i>The Internet generates new business opportunities</i> <i>Communication medium to improve organisational efficiency</i> <i>Better customer service</i> <i>Easy entry into new markets</i> <i>Promotional and adverting</i> <i>Global markets reach</i> <i>Easy access to global information</i>	
	Perceived usefulness of the Internet	
	Perceived richness of the Internet	
	Perceived Ease of use of the Internet	
	<b>Organisational factors</b>	Management Support
		Organisational resources
		Organisational size
<b>Environmental factors</b>	Competitive pressure	
	External pressure	
<b>Barriers to Internet adoption</b>	Security	
	Lack of knowledge	
	Cost of Investment	
	Limitation of infrastructure	
	Uncertainty about the Internet	
	Lack of universal electronic payment systems	

Source: (Case study data)

### 6.1.1 Propositions that emerged from the data analysis

Based on the analysis of the case studies, the study proposed a series of research propositions reflecting the complex and dynamic nature of Internet adoption and use in SMEs. The initial proposition from the first case then became a vehicle for generalising to the remaining cases. The emergent propositions from the first case were systematically compared with evidence from the second case. The theoretical propositions were either supported by evidence, revised or not supported for lack of sufficient evidence. The process was repeated until refined theoretical propositions were systematically compared with evidence from the other cases. This highly iterative process was to compare systematically the emerging theory with the evidence

from each case in order to assess how well or poorly it fitted with data. The central idea is that the researcher constantly compares theory and data – iterating toward a theory that closely fit the data (Eisenhardt, 1989), where data that supported the emergent theory enhanced confidence in its validity, while data that did not support the theory often provided an opportunity to refine and extend the theoretical model (Eisenhardt, 1989). Overall, the propositions developed in this case study defined preliminary categories that showed the factors that influence or inhibit SMEs decision in the adoption and use of the Internet. The propositions developed are shown in table 6.3

The compatibility of Internet technology, cost effectiveness, benefits of using the Internet, management support, organisational resources, organisational size, competitive pressure, external pressure, knowledge of the Internet, perceived usefulness of the Internet, perceived richness of the Internet, perceived ease of use of the Internet influence the rate of adoption and use of the Internet. While security of the Internet, lack of Internet knowledge, cost of investment, limitation of Internet infrastructure, uncertainty about the Internet, limitation of personal contact, lack of universal electronic payment systems, complexity of the Internet and lack of organisational resources inhibit the rate of adoption and use of the Internet. However, these are not the only factors that influence adoption of the Internet, but these factors emerged in the case study as influential in the decision to adopt or not to adopt the Internet in SMEs. The next section presents the case studies results, describing the experiences of SMEs in the process.

Table 6.3 Propositions that emerged from the data analysis

Core categories	Subcategories	Propositions
<i>Technological factors</i>	Compatibility	<i>The compatibility of the Internet with SMEs beliefs, values and IT infrastructure influences adoption and use of the Internet.</i>
	Complexity	<i>The complexity of the Internet inhibits its rate of adoption and use</i>
	Cost effectiveness	<i>The cost effectiveness of the Internet influences the decision to adopt and use the Internet</i>
	Benefits of using the Internet	<i>The greater the perceived benefits of the Internet, the more SMEs are likely to adopt it</i>
	Perceived usefulness of the Internet	<i>Perceived usefulness of the Internet influences SMEs decision to adopt and use the Internet.</i>
	Perceived richness of the Internet	<i>SMEs' perception of the Internet's qualities and its potential to facilitate tasks is more likely to influence SMEs decision to adopt and use the Internet</i>
	Perceived ease of use of the Internet	<i>Perceived ease of use of the Internet influences SMEs decision to adopt and use the Internet.</i>
<i>Organisational factors</i>	Management Support	<i>The greater the extent of management support, the more likely SMEs will adopt the Internet</i>
	Organisational resources	<i>Organisational resources influence the rate of adoption and use of the Internet while the lack of it inhibits adoption and use.</i>
	Organisational size	<i>The size of SMEs influences the adoption and use of the Internet</i>
<i>Environmental factors</i>	Competitive pressure	<i>The greater the competitive pressure in the industry, the more likely SMEs will adopt and use the Internet</i>
	External pressure	<i>SMEs that encounter pressure from their trading partners will adopt and use the Internet than those that do not encounter such pressure</i>
<i>Barriers to Internet adoption</i>	Security	<i>Security of the Internet is seen as inhibiting the rate of adoption and use of the Internet</i>
	Lack of Internet knowledge	<i>The knowledge of the Internet influences SME's decision to adopt and use the Internet while the lack of Internet knowledge inhibits adoption and use</i>
	Cost of Investment	<i>Cost of investing in Internet technology is seen as inhibiting adoption and use of the Internet</i>
	Limitation of infrastructure	<i>The limitation of Internet infrastructure is seen as inhibiting the rate of adoption and use of the Internet</i>
	Uncertainty about the Internet	<i>The uncertainty about the Internet is seen as inhibiting the rate of adoption and use of the Internet</i>
	Limitation of personal contact	<i>The limitation of personal contact is seen as inhibiting the rate of adoption and use of the Internet</i>
	Lack of universal electronic payment systems	<i>The lack of universal electronic payment systems is seen as inhibiting the rate of adoption and use of the Internet</i>

Source: (Case study data)

## 6.2 Results of case studies analysis

The previous section has analysed the SME cases that participated in this study and identified the factors that influenced and inhibited adoption of the Internet in business.

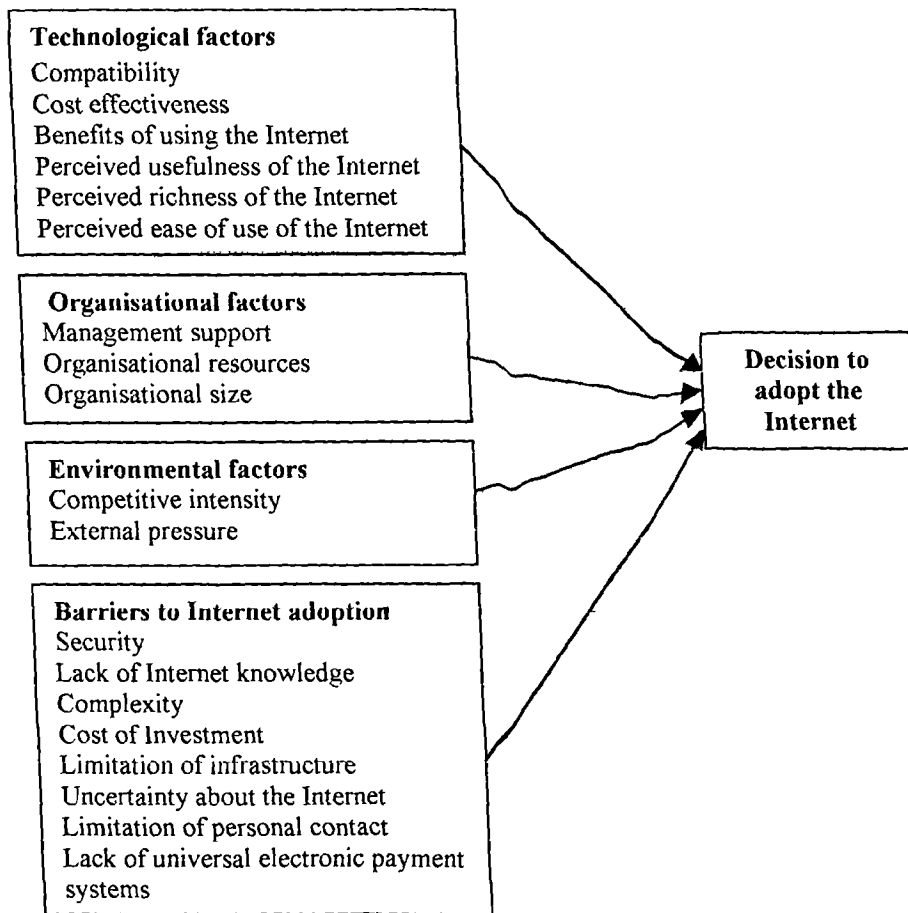
This section presents the results of the SMEs' experiences with the adoption and use of the Internet in business. The data from the case studies was analysed using



grounded theory technique (Glaser and Strauss, 1967; Strauss and Corbin, 1998). The grounded theory technique was discussed in chapter 4. The results from the case study were used to develop a theoretical model for conceptualising the organisational issues around the adoption and use of the Internet--issues that have been largely missing from contemporary discussions of Internet usage (Orlikowski, 1993). The results of the multiple case studies will be discussed in terms of the categories that emerged from the grounded theory analysis process. The intention is to identify and give substance to each of the categories.

The adoption factors that emerged from the SMEs' experiences with the Internet are depicted in figure 6.1. The figure shows the categories and concepts that emerged as salient from the data analysis, as well as their relationships. This theoretical model is proposed as an initial formulation of the key factors that influence SMEs decision to adopt and use the Internet in business. It attempts to show a 'map of the territory' based on the analysis developed from the case study data. It is "the researcher's first cut at making some explicit theoretical statements" (Miles and Huberman, 1994). The researcher sees the theoretical model as simply the current version of the map of territory being investigated. No claim is made that the factors and categories presented here are exhaustive. Further organisational studies of the adoption of the Internet should add to or modify the ideas presented here, that is how we build on each others' work (Orlikowski, 1993). The categories constituting the factors that influence or inhibit SME's decision to adopt and use the Internet in business are discussed below.

Figure 6.1 SME Internet Adoption Model



### 6.2.1 *Decision to adopt the Internet*

Researchers have identified several indicators of IT acceptance. The most generally accepted measures of IT in SMEs appear to be user satisfaction (Raymond, 1985; Yap et al, 1992), system usage (DeLone, 1988) and frequency of use has been employed as measure of implementation success (Davis, 1989; Davis, et al, 1989; Leonard-Barton and Deschamps, 1988). However, system usage has been the primary indicator of technology acceptance (Adams et al, 1992; Davis et al, 1989; Straub et al, 1995; Szajna 1996; Thompson et al, 1991). Further, system usage has a notable practical value for managers interested in evaluating the impact of IT (Straub et al. 1995). The focus of the case study is on the factors influencing the adoption of the Internet in SMEs. Therefore, decision to adopt the Internet is used as an indicator of Internet adoption. It is important to note that Internet usage related to the Internet technology in its entirety rather than to a specific function (email or web) of the Internet.

## 6.2.2 *Technological factors*

Technological factors represent the perceived characteristics of the Internet. The adoption and use of the Internet is strongly governed by how SMEs perceive the Internet and its capability to leverage it for business use. If SMEs perceive that the use of the Internet offers relative advantage over other technologies, for example reducing cost of communications, then it is likely to be adopted. The technological factor is described by six characteristics of the Internet that emerged from the case analysis, which is found to explain the adoption of the Internet in SMEs. These characteristics are compatibility of the Internet, cost effectiveness, benefits of using the Internet, perceived richness of the Internet, perceived usefulness of the Internet as a business tool and perceived ease of use of the Internet in carrying out tasks.

### 6.2.2.1 *Compatibility*

The compatibility of the Internet refers to the degree to which the use of the Internet is perceived as being consistent with the existing practices, values, past experiences, and the needs of SMEs. The Internet has the potential to introduce revolutionary changes to business processes such as sales and customer-supplier relationships. The objectives of the majority of SMEs using any technology in business are to improve efficiency and reduce operational costs. The case results show that across all SMEs, there is evidence of compatibility of the Internet to existing business practices.

BPC reports: "The use of the Internet enables us to co-ordinate and work more efficiently and also its use within the organisation supports our marketing activities". While BIL reports: "The use of the Internet levels the playing field, giving us the opportunity to advertise to a global market and compete with larger companies. We see the Internet as a medium of communication and a very easy one, to lower cost as far as we are concerned. It is another form of projecting information, goods and services to the global audience no different to television, radio, and newspapers".

The case result shows that compatibility is a significant factor contributing to the adoption of the Internet, the emphasis lies in the fit between the characteristics of the technology and the characteristics of the task. The more an innovation is compatible with the current situation of a potential adopter and its needs, the lesser are the switching costs and uncertainties, the more probable the innovation will be adopted (Frambach, 1993). The case findings provide support for diffusion of innovation theory and it is consistent with prior research which has shown that successful

innovations occurs when the task and the technology are compatible (Tornatzky and Klein, 1982). Greater compatibility of technological innovation with the existing technical systems, hardware, software, operating practices, and the value and belief systems of the adopting unit has been cited to be favourable to its rate of adoption and diffusion (Rogers, 1983; Tornatzky and Klein, 1982; Cooper and Zmud, 1990; Ettlie, Bridges, and O'Keefe, 1984; Floyd, 1988).

In their study of information technology implementation research, Cooper and Zmud (1990) observed a positive relationship between fit and adoption of manufacturing resources planning systems. They found that task-technology compatibility is a major factor in explaining manufacturing resources planning (MRP) adoption behaviours. They point out that studies attempting to explain the tendency of a sample of firms to adopt or reject a particular IT application that do not control for task-technology interactions are omitting a major factor that underlies technology adoption behaviours. Likewise, Floyd (1988) found that 'technology fit' influenced the optional use of electronic workstations. The more fitting or compatible the characteristics of the technology are with the work requirements, the more likely that particular technology will be adopted. Support was also obtained for the proposition that the fit between task characteristics and technology characteristics influenced adoption and the use of technology (Teo, Tan and Buk, 1997).

The case result also reaffirms the statement that organisations typically choose technologies that conform with certain internal values and experiences that are consistent, within limits with the technology that will later become available (Ettlie, 1986). In this way the organisation will need to make minimal adjustments and changes, which implies less resistance to the adoption. Thus, compatibility with current organisational operating practices is important to ensure a smooth integration with other internal IS applications and users' acceptance. Compatibility ensures greater security and lesser risk to the potential adopter and makes the innovation idea more meaningful to the organisation. In fact many innovations, which have ultimately been major successes, have started out as incremental types not deviating radically from current practices (Lymer et al, 1998). Recent research supports this view in the context of many strategic telecommunication-based systems, which are often incremental extensions of existing systems (Ramamurthy and Premkumar, 1995).

The case result also shows that an idea that is not compatible with the prevalent values and norms of SMEs will not be adopted as rapidly as an innovation that is compatible. This is consistent with previous studies that have found incompatibility of a new information system with existing work procedures, value systems, and IT infrastructure negatively affects users' attitudes and increases the resistance to change, thereby inhibiting adoption of an innovation (Teo et al, 1998). O'Callaghan, Kaufman, and Konsynski (1992) reported that system incompatibility was negatively associated with EDI adoption. Lack of standards and incompatibility of the hardware/software and the data formats have been cited to be major inhibitors to the expansion and wider use of EDI between trading partners (Ramamurthy and Premkumar, 1995).

#### *6.2.2.2 Cost-effectiveness*

The cost-effectiveness of the Internet compares to the initial cost of introducing the Internet in the organisation to the potential paybacks that can be generated. From the early days of its conception, information technology has been used to save money (Kimbrough and Lee, 1997). The use of the Internet enables SMEs to place brochure, catalogue, corporate information, and support material on-line for a fraction of the cost of print counterparts. For SMEs seeking internal document distribution, the web can often provide a magnitude of savings over traditional means. The positive reaction toward the web's low cost of entry reinforces Rogers' (1983) claim that trialability is a significant factor in the adoption of an innovation. SMEs perceive these lower development and maintenance costs as an advantage that allows for experimentation and reduces the risk associated with adopting a new technology like the Internet. A favourably low cost-benefit ratio helps to convince and reinforce the advantages of the Internet, and hence promotes its adoption.

The low costs of the Internet presence made it a low-risk strategy and very appealing to SMEs that lack the financial resources (Cragg and King, 1993) to use other methods of communicating to customers and marketing their products. Moreover, the lower operational costs and higher revenue leads to better organisational performance as SMEs can achieve a number of direct and indirect benefits through the Internet. It enables SMEs to leverage the Internet as new distribution channels, by reducing the cost of advertising and improving global reach. Most SMEs do not have the resources of big companies to advertise their products in the traditional way; however, the

Internet offers them the opportunity to mount aggressive advertisement just as the big companies. It provides SMEs with the cheapest form of advertisement relative to the number of people that it can reach.

AL reports: "A small company with a suitable product or service to sell can create as much of an impact in its own domain as a large business with a much larger budget".

CLR reports: "We sell our merchandise through the Internet and we regard it as a more cost-effective means of selling merchandise than the traditional route. It's a more cost-effective means of communicating because of the saving on paper and other overhead costs. The use of the Internet has made a key impact on our communication, staff can efficiently contact other staff in CLR America".

The case result shows that cost benefit is the most important when making a decision to use the Internet. This is certainly not surprising, since business decisions must be financially viable and also because of SMEs limited financial resources (Cragg and King, 19993). While SMEs commonly use the Internet as a means to reach more customers globally, the most immediate business case justification is cost reduction (Boynton et al, 1994; Deschoolmeester and Hee, 2000; Auger and Gallagher, 1997). The cost effectiveness of the Internet is found to be an important factor that influences adoption and use of the Internet (Ramamurthy and Premkumar, 1995; Tornatzky and Klein, 1982; Saunders and Clark, 1992; Kimbrough and Lee, 1997; Levy and Powell, 1998).

Zwass (1996) points out that Internet technology offers SMEs huge potential to transact business, communicate, share and retrieve information on a global scale at low cost. Kimbrough and Lee (1997) found that the most profound consequences of using the Internet in business is the dramatic decrease in the transaction costs of conducting and maintaining inter-organisational relationships. The Internet as an innovation is significant in that SMEs perceive the financial obstacles to their participation in electronic commerce have been reduced to the point where they can experiment without an overly burdensome commitment (Auger and Gallagher, 1997).

When the Internet is perceived to be more cost-effective, SMEs will actively integrate it with internal IS applications thereby maximising their benefits. These findings are *supportive of statements* made earlier that smaller firms are more dependent on what

Rogers (1983) refers to as a high relative advantage of the Internet and that smaller businesses, given their more limited financial resources, have a lower threshold for costly experimentation. Ramamurthy and Premkumar (1995) found that most of the benefits accrued by information technology innovations are often intangible or difficult to quantify. Cost-effectiveness, which measures the perceived benefits relative to cost, was more appropriate. Tornatzky and Klein (1982) reported similar finding, they pointed out that cost of an innovation was assumed to be related to the adoption of innovation, the less expensive the innovation, the more likely it will be quickly adopted.

#### *6.2.2.3 Benefit of using the Internet*

Benefits of using the Internet is similar to Rogers (1983)' relative advantage. Internet benefit deals with the degree of managerial valuation of the relative advantage that can be derived from the use of the Internet in business. Kwon and Zmud (1987) defined relative advantage as the degree to which adopting the Internet is perceived as providing greater organisational benefits than maintaining the status quo situation. The degree of relative advantage is often expressed in economic profitability, savings in time and effort, cost reduction or status given (Cragg and King, 1993). A higher managerial recognition of Internet benefits (i.e., direct and indirect benefits) increases the likelihood of the allocation of the managerial, financial, and technological resources necessary to the adoption and use of the Internet (Benbasat et al, 1993).

The case result shows the greater the perceived relative advantage of an innovation; the more rapid its rate of adoption is going to be. This is consistent with the findings of other diffusion scholars that have found relative advantage as the only variable that has been consistently identified as one of the most critical adoption factors (Rogers, 1983; Tornatzky and Klein, 1982; O'Callaghan, Kaufman and Konsynski, 1992) and as the most important factor for information technology growth in small firms (Cragg and King, 1993). According to O'Callaghan, Kaufman and Konsynski (1992), relative advantage in efficiency and customer service has been a crucial motivation in the adoption of EDI by insurance agents. Mason reported similar findings, he found that most SMEs decided to adopt new technologies based on perceived benefits and costs savings. Lymer et al (1998) found that business adopt the Internet because of the benefits to be gained from its use. Iacovou et al (1995) found that perceived benefit is

one of the critical factors for EDI adoption among small businesses. They indicated that strong managerial perception that EDI will generate substantial relative advantage propelled management to adopt EDI.

The case studies illustrate several types of benefits. All the SMEs wanted to save time and effort by improving their communication to their customers and business partners. Among the SMEs, the benefits gained from the Internet can only be described as 'perceived benefits', that is, benefits are based on individual SME's experiences. The case evidence shows some of the major benefits gained from the use of the Internet. These benefits are classified into two groups. The first group is direct benefits such as cost reduction, and ability to generate new business opportunities. The second group is indirect benefits or opportunities which refer to the impact of the Internet on business operations such as operational efficiency, better customer service, increased ability to compete, promotional and image building, global market reach and easy access to global information and easy entry to new markets.

Poon and Swatman (1999) found that perceived benefit is a key reason why small firms adopted and continue to use the Internet. Similarly, they classified perceived benefits into 'direct' and 'indirect' categories. Direct benefits are readily quantifiable by means of such techniques as financial data, number of new customers or other quantitative evidence. Indirect benefits are not easily quantifiable but they have a position effect on the business (e.g. customer goodwill). Their evidence shows that these can be further broken down into short- and long-term benefits. For Internet commerce, short-term benefits can be realised within a few months, whereas long-term benefits may take longer and can be unpredictable. The relationships between these perceived benefits are illustrated in figure 6.2.



Figure 6.2. A framework of benefit in the context of SMEs

Direct benefits	Examples: - save in communication costs - generate short term revenue	examples: - secure returning customers - long term business partnership
Indirect benefits	Examples: - potential business opportunities - advertising and marketing	examples - ongoing business transformation - new business initiatives
	Short term	long term

Sources: (Poon and Swatman, 1999)

Poon and Swatman (1999) findings suggested that SMEs are not reaping significant short-term benefits from Internet commerce activities. They indicate that sale and online transactions have been two of the most disappointing issues among this group. This is consistent with the case study findings, which shows that the majority of SMEs used the Internet as a communication medium and as a research tool for searching and gathering information rather than as a sales tool. The case result shows that only one SME (CLR) uses the Internet to conduct transactions. Many of the SMEs believed that either their offerings were not easily purchased over the Internet, or that they require some form of face-to-face interaction in addition to the Internet presence.

The case result indicates that indirect benefits are the key motive for ongoing Internet commerce activities. The Internet is seen as a viable means to exchange information with business partners and customers. The use of the Internet allows SMEs to be in contact with suppliers and customers all over the world, this is particularly important for small businesses, who are heavily involved in business activities with clients who are geographically dispersed. The result shows that almost all the SMEs viewed the Internet as a versatile medium which has general accessibility and vast geographic reach, coupled with the ability to break down geographic barriers. All SMEs have experienced some form of new opportunity since connecting to the Internet (e.g. an unexpected customer inquiry, forming a new business network, or accidentally discovering something, which can positively or negatively affect their business). Although there is no guarantee that these opportunities will continue in any manner, however, the explosive growth of the Internet makes this look both possible and

promising. The evidence of these perceived benefits are presented and discussed in turn.

*The Internet generates new business opportunities:* The analysis result indicates that six of the SMEs (BPC, FP, MGL, AL, BIL and CLR) report generating businesses through the Internet. The other had either improved its competitiveness and business performance or access to international markets. The explosive growth of the Internet and increasing consumer confidence with Internet technology opens the door for SMEs to reach customers around the world. Its use allows SMEs to capitalise on the array of information available through the Internet and the new levels of interaction that it promotes. Using the Internet to conduct transactions remove all the geographic constraint found in the traditional method and it is considered the most cost-effective means to sell products to wider markets. The case result shows that marketing on the Internet not only enables SMEs to reach a wider audience but also it helps them to reduce marketing cost by providing them with a 24 hour a day, 7 days a week global sales outlet. Most of the SMEs believed that if they engaged in Internet commerce, they would be more ready to capture unexpected business opportunities.

BPC reports: "We use the Internet in our company as sales tools that support our printed brochure. Since we started using the Internet our email correspondence have been increasing on a daily basis. People are more willing to communicate to us through email. For example, our company was approached by an overseas company inquiring about publishing a magazine for them in a foreign language".

FP reports: "We have received overseas investors' inquiries concerning special floor tiles, that we wouldn't have had without the Internet. Anything that generates inquiries to us is great, some of the inquiries have lead us to win contracts".

MGL reports: "... on one occasion we used e-mail to send off designs to an overseas firm and have used it to receive customers' inquiries. The Internet is a very important source for getting and ordering products for our business".

AL reports: "The use of the Internet has certainly helped increase sales inquiries, generate sales and maintains business. It is too soon to tell if the over-all profitability has increased. However, the sales we have generated from being on the Internet have all been outside our area and would not have occurred otherwise".

BIL reports: "The Internet is another selling tool to provide information and advertise products to the global audience. We have had a few inquiries of the Internet, which we sold our products as a result. We are starting to get a bit of business of the Internet and its use is increasing rapidly".

CLR reports: "The use of the Internet has enabled us to sell CLR wear to a wider audience. We use our web site to conduct transactions and it has proved to be the most efficient way of selling CLR wear. We receive about 60% of our orders through the Internet; it is a very important source for getting and ordering CLR wear".

*Communication medium to improve organisational efficiency:* The usability of the Internet and its ability to enable communication in all directions made significant contributions to the variability in adoption and use. The evidence reveals that SMEs most often use the Internet as a communication medium to improve organisational efficiency and as a 'dynamic' and 'interactive' way of communicating to customers. All the SMEs used the Internet primarily in this way and they reported that its use had made communication easier, better and faster. The speed of communication and speed of access to information and the documentary record of action of email was regarded as beneficial.

In all the cases there is clear evidence of improved communication facilities having been developed with existing customers and suppliers and in a few cases some new business has been won through this use. Most SMEs feel that the Internet succeeds in providing what the telephone or fax services do not offer, asynchronous communication, overcoming time and geographic limitations and enabling electronic document transmission. The asynchronous ability provided notable benefits when communicating with customers in different time zones. Most SMEs found the ability to communicate with email, particularly with international customers or business partners without necessarily being worried about their whereabouts was convenient.

The growth of email is mainly due to two factors: It is virtually free and it is widely available. Cost savings drove most SMEs to use e-mail in the first place. Email is nine times more popular than post (Which? Online, 2000). Email delivers flexibility and convenience to communications, particularly for many small businesses that rely on personal contact with their customers. It offers a fast, inexpensive way for SMEs to communicate both internally and externally. It allows SMEs to send and receive messages and data world-wide quickly and cheaply. According to PriceWaterHouse Cooper's 1999 consumer technology survey, email is the most popular reason for joining the Internet. Likewise, Datamonitor cites that by 2004 email contact will mushroom and account for 30% of all global contact. Email allows a non-intrusive

message exchange, and the ability to exchange multimedia documents provide convenience and cost-savings.

When comparing email communication with other methods, most of the SMEs were in agreement that it was a far easier mode of communication, that messages could be composed and sent fairly quickly. However, there are circumstances where email cannot be used. For example firms AL, MGL and SAH felt that they could not send confidential documents over the Internet because of legal and privacy concerns. SAH used email to appeal for donations from the general public. Other firms were unable to use email as a document transfer mechanism because their documents are largely paper-based. Some (e.g. BIL) said that they needed to conduct highly interactive discussions with their customers and therefore, required instant responses over the telephone.

AL reports: "We often need to exchange design documents. In the past, such document exchange was done using the postal services or fax. With e-mail, documents could be exchanged as email attachments and this greatly reduced the turnaround time. Also, this reduced ambiguity when joint design work was involved because any changes could be made directly on the document. The important point is that these were all achieved without added communication costs".

BPC reports: "We use email to exchange design documents with our business partners, by sending an electronic version of our design as e-mail attachments. If email were not used for document exchange, a computer disk or laser-printed documents would have to be physically sent because faxed copies do not provide sufficient resolution for such documents".

BIL reports: "Email is just a method of communicating with people. We see it as a thing, which connects us with someone else. It is a quick and easy way to communicate to customers on a global basis with the same ease that larger organisations communicate internally using their internal local area networks".

AL reports: "We began our Internet commerce activities largely to improve our internal operations through improved communication. Having an email connection was as necessary as the need for a fax number. It is difficult to quantify how much business the fax service can bring in, but it is essential to have a fax machine in most businesses".

FP reports: "The use of email for communication has been quite a breakthrough because there is less paper about and it's far quicker to send information and cheaper than sending fax, especially to our world-wide offices. We can send them documents that they can then edit and then return back to us, where as not long ago we could

have a contract agreement that is over 50 pages long, it would then have to be recreated in the U.K wasting time and money".

MGL reports: "We use the Internet for communication among group members (primarily email at present because our company is in the process of developing a web site). The Internet for communication has been very beneficial; we can easily and quickly communicate to customers and potential customers at a very low cost. It has made our communication more efficient, and it's far easier to turn around and send an email fairly quickly. If you get on the phone, one hour will be gone before you know it, but with email, ... you're done much more quickly. Our customers use email to place orders and make inquiries regarding our products".

CLR reports: "We use email to communicate with all our agencies, it's a hard copy that you can refer to and back track to if things go wrong, the good thing about email is that you've got a written record of it".

The result indicates that not only email was the most used tool for communication, but it was also one of the most popular methods of advertising to reach millions of people globally. For example CLR uses it to communicate and advertise their entire range of products to a wider audience. It is important to note however, that not all types of communication were improved in all the SMEs examined. BPC reports that some times it is better to communicate to customers using telephone or fax.

*Better customer service:* There is evidence to suggest that three of the SMEs (FP, CLR and AL) use their presence on the Internet to provide customer support. Customers could easily browse through catalogues and get information about products and services at any time through the web site, instead of phoning, and also they could easily email inquiries to the help-desk. These SMEs report that by handling questions and comments received via the web or email, customers receive a direct and quick response, which reduces the amount of time, devoted to responding to questions and comments.

FP reports: "We use our web site more like a reference-marketing site, where customers can email us with any queries or questions regarding our products".

CLR reports: "Customers can get in touch with us at their convenience, the Internet enables our customers to view our brochures about current and up-coming products. Customers can receive instructions on how to fix a common problem and they can also leave messages, which include their feelings or questions concerning our products".

AL reports: "The interactive capability of the Internet enables us to provide better customer service and also to tap on our existing and prospective customers for ideas to differentiate our products and services".

*Easy entry into new markets:* The Internet is a great leveller. It allows easier entry into new markets, especially geographically remote markets, as the playing field becomes more level between companies of different sizes and budget, thereby giving SMEs the opportunity to compete with larger companies on an equal footing.

BIL reports: "... all sites on the Internet are equal irrespective of company size. Being on the Internet lessens ones sense of where a company is located or what a company's size is. Larger companies do not gain any edge from their presence on the Internet over their smaller counterparts. We regard the Internet as a great equaliser, where a smaller company like us can be a larger company in a global market".

FP reports: "... eliminating time zones, natural barriers, and country borders not only aids a company with internal communications, it also levels the playing field for businesses".

*Promotional and advertising:* The case evidence shows that the promotional and advertising benefits of the Internet presence are very important in the decision to adopt and use the Internet. It indicates that SMEs perceive the Internet as a new and innovative method of promoting their products to wider customers. All the SMEs view the Internet as a new medium for advertising to supplement the traditional media of television, radio, and print.

AL reports: "The Internet offers us an opportunity for new promotion strategies and it enables us to enhance the branding of our products. Its use has made us aware of our competitors and markets in general".

The image-building benefit of the Internet presence is considered more important in the decision to use the Internet for medium businesses than for smaller businesses. This demonstrates that the medium businesses perceive an Internet presence reflects positively on their image, possibly creating a halo effect through perceived technology leadership. This is evident in CLR, which reports that it is important for them to have Internet access because its use increases their credibility and their leadership in the marketplace.

The result shows that where businesses have connected to the Internet, they are mainly using them as an 'electronic brochure' and primarily for advertisement and communication. The only form of interaction was for the customer to place orders for selected services, with the web site being set up primarily for informational purposes, with only CLR actual doing business using more sophisticated operations such as conducting transactions. More sophisticated transactions on the Internet require more technical expertise and possibly more sizeable investment, both in terms of human resources and capital not considered feasible for most smaller businesses.

The evidence demonstrates that most of the SMEs view their web sites as being quite an important part of their advertising effort and consider its use as a major part of their publicity and a means to establish their companies in the global world. The use of the web gives SMEs access to pages of business information and it lets them promote and sell their products and services. It offers them a real opportunity to compete in a global market by offering low operating costs and the ability to do business round the clock and the chance to foster better customer relationships. The web is seen as a positive development, which has enhanced the usability of the Internet and allows SMEs to 'reach' out in their presentation of their companies, products and service to a wide audience in a way that no other mechanism could allow at so little cost. This is seen as a good way to reach and test new international markets and is regarded as one of the benefits that the Internet can offer SMEs particularly smaller companies that cannot afford to develop their business abroad through traditional channels.

*Global markets reach:* SMEs market is bounded by the customers it can reach effectively. Two SMEs (AL and BPC) have all used the Internet to expand markets and contact customers previously out of reach. The Internet provides universal and global connectivity and provides new opportunities for SMEs to market themselves on a world-wide basis and sell goods and services to consumers. The use of the Internet removes geographic boundaries, allowing even the smallest business to easily and cheaply reach potential customers around the globe for a fraction of what it costs to do direct mail or run advertisements in a magazines or newspapers. Customers can make purchases from anywhere in the world as easily as they can from a shop down the

street. Expanding customers and markets and reachability were seen as the driving force in the adoption and use of the Internet in business.

AL reports: "The Internet activities have largely replaced our conventional business, we have generated sales outside our area that would not have occurred otherwise".

SAH reports: "The Internet is still a minor part of our activities, we use it just to provide information to the general public regarding the activities of the hospice".

BPC reports: "The use of the Internet enables us to do video conferencing. Long distance demonstrations can be made through video and data conferencing, which can achieve what a face-to-face meeting can but without any of the associated travel costs or time away from the office".

*Easy access to global information:* All the SMEs use the Internet to access information previously unavailable or unknown to them, this includes the ability to search databases world wide. Three of the SMEs (AL, FP and MGL) report using the Internet to search for customer information and obtain specific information for marketing purposes. The Internet is seen as a very useful market research tool to access a variety of information from all over the world and it represents an improved means to access global resources. The result suggests that reducing operational costs of traditional communication, and information access are some of the benefits of using the Internet in business. This is evident in terms of speed of access to information and in terms of overcoming time zone restrictions. In general, the enhanced speed of communication is viewed as advantageously as is the speed of access to information.

AL reports: "... regarding the speed of access to information, the Internet enables us to quickly communicate with our customers and suppliers in different parts of the world and it provides us with instant access to a myriad of information relevant to our business".

The asynchronous nature of Internet communication is viewed as being of notable benefit when communicating with customers or business associates operating in different time zones.

FP reports: "We use the Internet to easily access a repository of databases of information useful to the running of our business. We regard the Internet as a very useful research tool that saves time, money and energy in searching, gathering, and retrieving information at very low cost".



MGL reports: "The use of the Internet enables us to maintain communication with our overseas customers and business associates, which we might otherwise avoid, partly because of the expense and partly because of time differences".

Based on the evidence from the case study, it could be argued that speed and cost were the main reasons for adopting and using the Internet for communication, especially for smaller companies that regularly communicate with people in different time zones.

The findings of the case study supports evidence produced elsewhere (Barker, 1994; Lymer, Nayak, Johnson and Spaul, 1998; Chappell and Feindt, 1999; Poon and Swatman, 1997, 1998) which suggest that the Internet is likely to be used to improve business reach, advertising, as an access facility to global information and as a communication tool for networking, research and development (Cooper and Zmud, 1990) and global communication with vendors and customers (Cockburn and Wilson, 1996). These concepts are also supported, for example, Poon and Swatman (1998) conducted a survey of Australian small businesses and found that the most important factors or business drivers for Internet adoption in small business range from wider corporate exposure to company image enhancement. Likewise, Auger and Gallagher (1997) reported that the most important factors for Internet adoption in SMEs were wider corporate exposure, communication among organisational offices and inter-organisational linkages and ties. Barker (1994) was among the first who conducted research on the importance of the Internet for small businesses. Baker concluded that searching for customer information and obtaining specific information for marketing purposes were the most important benefits the Internet offered to small businesses.

Poon and Strom (1997) reported direct and indirect advertising, low cost communication, easy access to potential customers, and company image enhancement were the most influential factors in the decision to adopt and use the Internet in business. Riemenschneider and Mckinny (1999) found that the advantages of using the Internet were improved communication and information accessibility, enhanced distribution of information, and increased speed in getting tasks completed. Michalski (1996) found that businesses are compelled to use the Internet for the following benefits. First, the Internet provides global access to large audience at a relatively inexpensive price. Second, it offers essentially unlimited real estate and the ability to

connect with millions of users. Third, the Internet allows SMEs to have a virtual front door to a large audience through a web site as well as creating useful interactions with customers and suppliers. The Internet offers SMEs real business benefits and opportunities to improve efficiency, reduce costs and increase productivity and profits (DTI, 1999).

#### *6.2.2.4 Perceived richness of the Internet*

The adoption and use of the Internet is strongly governed by how SMEs perceive the Internet and its capability to leverage it for business. If the Internet is perceived as rich enough for SMEs needs and capable of supporting and improving organisational tasks, it is more likely to be adopted and used than if it is not perceived as sufficiently rich. The case result shows that perceptions of the Internet's richness influence the adoption and use of the Internet. Fuller and Jenkins (1995) reported an experimental study on the learning and business transformation process of small business adoption. They found that the information richness of the environment in which the firm operates, the necessity to collaborate in order to compete, and the business cultures present in communicating electronically all play an important role in the adoption and use of the Internet.

The Internet has important implications for organisations; for example, it offers gains in both effectiveness and efficiency. It also has the potential to change the nature and diversity of interpersonal interactions and how business is conducted (Fulk, Power and Schmitz, 1986) as well as the organisation itself (Rogers, 1986). The asynchrony of the Internet allows greater freedom for SMEs, and its use speeds up information exchange, and contributes greatly to improvement and efficiency changes in organisation. The ability to reduce the impact of geographic boundaries enables SMEs to work in configurations and with people they might not normally work with. SMEs are no longer bound by rigid schedules or traditional modes of communicating to their customers.

The case study result also highlights a clear role for social influence factors. Across all SMEs, the reachability of others via the Internet was a factor in the decision to adopt and use the Internet. The Internet enables free information exchange and gives SMEs the ability to perform a variety of activities such as easy access to global

information and to reach out to customers around the globe. As suggested by Markus's (1987, 1990) critical mass theory, reachability reflects not only social influence but also the practicality of making contact with less extensive users.

FP reports: "The use of the Internet provides us with easy link to information and diminishes the three boundaries of time, territory, and technology and it helps us to see our market more clearly".

However, SME's may form negative attitude towards the Internet because of the influence from other people within or outside their social environment (for e.g. the Internet is not secure). If they perceive that the Internet is not secure and using it might allow competitors to intercept or copy their data; then they are more likely not to adopt the Internet. This perception of insecurity of the Internet may have been conveyed by social information communicated among SMEs through other people.

MGL reports: "Security is still the main problem preventing people from using the Internet, we are still a little bit unsure on security of information. It is probably not founded but it does make you think".

#### *6.2.2.5 Perceived usefulness of the Internet*

The perceived usefulness of the Internet is defined as the prospective SMEs' subjective probability that *using the Internet* will increase job performance and improve efficiency (Davis 1989). The case result shows that the Internet is considered a useful business tool for carrying out tasks in the organisation. Across all SMEs, the Internet is perceived as an extremely useful business tool for information dissemination to customers, to search and gather information, to communicate and to provide better customer service. Also as a tool to improve access to both information and people working in other organisations. The use of the Internet for communication is especially useful in that it provides an efficient, informal and inexpensive method of communicating with customers and business associates. It is also regarded as a useful tool for market research to find out about the movement and trends in business marketplace, the actions of business competitors and partners, and resources of value to the efficient operation of business. The case shows that four of the SMEs (FP, CLR, MGL and BPC) report that the use of the Internet has been useful as a research tool and they are able to work more efficiently.

FP reports: "The use of the Internet has certainly made a big impact on our dealing with the international offices by breaking the different time zones. Overcoming time zone limitations facilitated the collaboration of work with colleagues based in other overseas offices. The Internet enables us to work closer as a company, you feel like the person is in the next room. One can easily send a message to somebody in another office instead of physically getting up and walking round and walk back again. The main benefits to us was having diversified departmental teams working together on a project, and the use of Internet has helped to crumble the interdepartmental walls".

CLR reports: "The use of the Internet gives us the option of working with more people and its use facilitates the exchange of shared databases, which reduces data redundancies. It has made us work more efficiently and helps us to interact with our customers and get feedback from them".

MGL reports: "... describes the relative ease with which their company was able to find information, which was unavailable locally. The Internet allowed us "to cast a wider net" which meant that retrieving information became much easier".

BPC reports: "the usefulness of the Internet in business is growing especially in searching and gathering information about competitors, and its usefulness is undeniably growing. The Internet provides the easiest, most efficient, and most cost effective means of gathering information".

The case result supports what other empirical studies have suggested that SMEs are more likely to adopt and use the Internet if they perceive the Internet as a useful tool to perform tasks or carry out business transactions (Golden, Beauclair and Sussman, 1992). The importance of perceived usefulness of the Internet as an important factor derives from the theory of reasoned action (TRA) and technology acceptance model (TAM), which propose that perceived usefulness affects Internet adoption due to the reinforcement value of outcomes (Davis, 1989). These findings support Adams et al. (1992), Davis et al. (1989), Straub et al. (1995), and Szajna (1996) that found SMEs adoption of the Internet is driven to a large extent by perceived usefulness of the technology. This is also consistent with the views of Rogers (1983) concerning the adoption of innovations in general. Rogers claims that adoption is a function of a variety of factors, including relative advantage and ease-of-use of the innovation.

Several investigators have found a significant relationship between system characteristics and measures similar to perceived usefulness (Benbasat and Dexter 1986; Benbasat, Dexter and Todd 1986). Szajna (1996) reported that perceived usefulness has a direct effect on personal computing acceptance. Other studies have also reported that perceived usefulness is positively associated with system usage

(Thompson et al., 1991). In their study of the factors affecting electronic mail, Fulk, Schmitz, Ryu, and Steinfield (1989) found that electronic mail use was predicted by the perceptions of the medium's usefulness held by communication network partners. Similarly, Golden, Beauclair, and Sussman (1992) found that user perception of the medium's usefulness-influenced adoption and use of email in organisation. However, these findings contradict Igbaria et al (1997) who found perceived ease of use and perceived usefulness as mediating factors on personal computing acceptance. The reasons for this contradiction could be due to the use of different dependent categories; this study focused on adoption of the Internet, while Igbaria et al,'s study studied personal computing acceptance.

#### *6.2.2.6 Perceived ease of use of the Internet*

Perceived ease of use of the Internet refers to the degree to which Internet technology is perceived by SMEs as relatively easy to use (Davis, 1989). Ease of use is a familiar concept that has received considerable attention in the user satisfaction stream of IS research (Davis, 1989; Davis et al, 1989; Adams et al, 1992; Van der Heijden, 2000) and also in the e-commerce literature (Oinas-Kukkonen, 2000). Perceived ease of use ensures the ultimate success of Internet use and adoption (Gupta, 1995). The technical feasibility of the Internet will be resisted if SMEs deem it too complicated to use.

The perceived ease of use of the Internet emerged in the case analysis as one of the categories directly influencing SMEs decision to adopt the Internet. This finding supports Adams et al. (1992) which found both perceived usefulness and perceived ease of use as important determinants of system usage. Straub et al (1995) and Thompson et al (1991) have reported similar findings. They suggest that, in addition to perceived usefulness, usage can also be influenced by perceived ease of use. However, these findings are inconsistent with previous studies (Taylor and Todd, 1995; Szajna, 1996). Perceived ease of use is sometimes conceptualised, as influencing perceived usefulness rather than influencing IT usage (Taylor and Todd, 1995).

Davis, Bagozzi and Warshaw (1989) identify perceived ease of use as an important determinant of system usage through perceived usefulness. Davis (1989) suggests that perceived ease of use might actually be a causal antecedent to perceived usefulness.

Szajna (1996) reports that perceived ease of use explains a significant amount of the variance in perceived usefulness. The findings of Igbaria et al (1997) indicated that perceived ease of use was a dominant factor in explaining perceived usefulness and system usage, and that perceived usefulness has a strong effect on system usage. The reasons for this inconsistency could be due to the use of different dependent categories; this study focused on adoption of the Internet, while these studied personal computing acceptance (Igbaria et al, 1997) and user acceptance of information technology (Davis et al, 1989; Adams et al, 1992).

The case evidence showed that across all SMEs, the Internet was perceived as easy to use particularly email and searching for information. The increased ease of communication was evident from the SMEs that felt that email communication was less formal and much more interactive. Customers are more inclined to reply electronically, because the process of communication is easier. MGL reports that the Internet is a quick and easy means to communicate to customers. In general, new ideas that are simpler to understand will be adopted more rapidly than innovations that require the adopter to develop new skills and understandings. All else being equal, Davis claims, an application perceived to be easier to use than another is more likely to be adopted and used (Davis, 1989; Taylor and Todd, 1995). However, this relationship holds for systems of a voluntary nature only (DeLone and McLean, 1992; Gelderman, 1998).

### ***6.2.3 Organisational factors***

Organisational factors are those categories affecting the organisational structure that the organisation could adjust or change to suit its changing environment. Three categories that emerged from the analysis include management support, organisational resources and organisational size.

#### ***6.2.3.1 Management Support***

Management support refers to the perceived level of general support offered by management. Individuals rarely have complete autonomy regarding the adoption and use of work place innovations. Management support can take a variety of forms such as encouraging or discouraging adoption of the Internet explicitly through expressed preferences and mandates (Leonard-Barton and Deschamps, 1988; Moore and

Benbasat, 1991), or implicitly through reward systems and incentives (Leonard-Barton, 1987). Management typically controls access to the infrastructure supporting adoption, such as allocating resources, offering educational programs, applying information technology to support a wider variety of business tasks, and encouraging experimentation with the Internet and may even control physical access to the hardware and/or software needed to use innovation (Leonard-Barton 1987; Leonard-Barton and Deschamps 1988).

The perception of the Internet being able to reach a wider base of customers and its potential to alter SMEs existing practices stresses the need for management support so as to ensure a successful integration into and acceptance by the entire organisation. Management is not only expected to carry on the crusade for adoption within the organisation. They also need to take responsibility for overcoming the apprehension and resistance to the innovation, organising needed resources and being closely involved in various phases of adoption, implementation and transfer (Ramamurthy and Premkumar, 1995) and convince staff of the benefits that will accrue from using the Internet. The openness and global connectivity of Internet technology allows easy exchange of ideas and knowledge across organisational and geographical boundaries. The case result highlights considerable awareness among SMEs concerning the potential of the Internet and a high level of enthusiasm for learning more about it.

The case results show that across all SMEs, there is evidence of managerial enthusiasm towards Internet use. One of the directors of MGL undertook web site development, despite the severe financial constraints. She was fascinated with Internet technology and gained considerable job satisfaction from the use of the Internet.

AL report: "The managers at AL frequently use the Internet in their work. The Internet not only allows a business to easily share information within all branches of the company, but also allows every employee to have access to an unbelievable amount of information from a variety of other sources. The amount of information that we can get about things useful to our business is endless. We can find and gather information more easily about our competitors, suppliers and customers".

BPC report: "The owner of BPC, although not a hands-on user, encouraged all his employees to use the Internet".

It is argued that SMEs with full management support would most likely consider adopting the Internet in response to the current technological trends and market demands, where as a lack of it has often been cited as a barrier to effective use of systems (McMaster, Vidgen, and Wastell, 1997). They found that lack of staff involvement and lack of senior management support resulted in the failure of UK City Council (UKCC) to adopt a structured method (SSADM) as its systems development methodology. They reported that the Chief Development Officer (CDO) appeared to be operating more or less on her own, with no support from other departments or the senior management echelons. They indicated that two factors, user involvement and senior management support, were generally held to be critical to the success of any innovation (McMaster, Vidgen, and Wastell, 1997; Baroudi, Olson and Ives 1986).

Active involvement and support of management is capable of providing the appropriate strategic vision and direction. Management support creates a more conducive environment for the adoption and use of the Internet. Management support and commitment are crucial factors that contribute to the adoption and use of the Internet in SMEs. The more support given by management, the more likely organisational resources would be allocated to the implementation of innovation decisions, which will in turn facilitates the adoption and success of an innovation.

The case result is consistent with previous organisational and IS research (Sanders, and Courtney, 1985; Leonard-Barton and Deschamps, 1988; Cooper and Zmud, 1990; Swanson, 1988; Zmud, 1984, 1987; Baroudi, Olson and Ives 1986; Moore and Benbasat, 1991; Frambach, 1993; Wolf, 1994; Kurnia and Johnston, 2000; Cragg and King, 1993; Boynton et al, 1994; Igarria et al, 1997; Ettlíe, 1986; Martin, 1989; Runge and Earl, 1988; Yap et al, 1992; DeLone, 1988; Jarvenpaa and Ives, 1991; Ramamurthy, and Premkumar, 1995), which found management support to be important in the adoption of innovation, and also high levels of communication about the benefits of an innovation to potential adopters (Rogers, 1983; Ives and Olson, 1984). DeLone (1988) found that, in small firms, the chief executive officer (CEO) has a greater influence on a company's performance than does the CEO of a larger firm. The CEO of a small firm usually has an "enormous impact-via his power, his face-to-face contacts with virtually all employees, his ownership, and the immediate effects of his expressed goals, perceptions and preferences" (DeLone, 1988). This



may suggest that management support may be much more important in small firms where the owner or CEO is commonly involved in most key operational decisions due to lack of managerial staff, and is perhaps the only one who can harness information technology to corporate objectives and strategy.

The primary finding of DeLone's (1988) small-firm study is that the successful use of computers was strongly linked to CEO knowledge of computers and active involvement in the computerisation efforts. Yap et al. (1992) also found a similar positive correlation between IS success and CEO support. Igbaria et al. (1997) found that management support had a positive influence on computing acceptance. Clowes (1982) found that the attitudes and behaviour of owner/managers of SMEs were major factors in influencing the continued success of computer system development efforts. Cragg and King (1993) found in their study of small business that the strongest motivating factor was the owner's enthusiasm toward computing. Schmitz and Fulk (1991) found that almost all participants in their study emphasised the substantial and positive influence of the organisational CEO on electronic mail use. Poon and Swatman (1999) found that direct management involvement was common among their case study participants, they indicated that management not only knows, but sometimes assumes a hands-on role in Internet commerce activities such as answering customer inquires and web pages design.

Research in other IS literature also reiterates the key role of champions for adoption of new systems (Reich and Benbasat, 1990). It has been suggested that successful adoption, implementation, and diffusion of innovations can be traced to the critical role played by champions (Ettlie, Bridges, and O'Keefe, 1984), from building awareness of the innovation through to generating and maintaining a sustained momentum during its adoption and diffusion (Ramamurthy and Premkumar, 1995). Blili and Raymond (1993) and Naylor and Williams (1994) cited the importance of the owner as champion. Runge and Earl (1988) reported that the role of a product champion was important for the successful implementation of telecommunications solutions. Markus (1987) found that use by key leaders as well as the presence of an enthusiastic, higher level "champion" induces organisation to adopt and use IT.

Among the SMEs interviewees in this study, the majority of them were at the most senior level in the firm. In these cases, the interviewees had very good support from management (e.g. financial support). The types of involvement varied - ranging from hands-on technical development to actively initiating Internet commerce projects. This pattern was also described by Barker et al. (1997). As did Range and Earl (1988) and Poon and Swatman (1999), the case study found that most of these champions did not have formal IT training, but rather learned of the Internet through public media, friends, business partners, and gradually gained experience through experimentation. But one thing is common, they all saw that their firms could make use of this technology to open up new opportunities. Those who belong to the hands-on group often come from smaller businesses. Medium businesses hire expert to build their Internet commerce solutions. There were also examples of smaller business not directly involved in hands-on development (AL).

The case result suggests that owners of small firms are either interested in experiencing Internet commerce activities or lack the financial resources to pay for external services. For the medium firms, management in general, was not directly involved in the development process beyond the role of project manager (FP and CLR). FP and CLR outsourced their Internet commerce project to external contractors but retained the project management role; often they see their role as manager and not technical staff.

#### *6.2.3.2 Organisational resources*

Organisational resources refer to the level of financial and technological resources of SMEs. Much of the reported empirical work on Internet usage assumes that the Internet provides value and that all organisations would benefit from using it, with little regard for organisational characteristics that might predispose success or lack of success. Organisations may realise some benefit from the use of Internet technology, but only if they have the necessary resources and management support.

The result shows that SMEs tend to lack the organisational resources (i.e., capital, people, and technology) that are necessary for the Internet and other IT investments (Bouchard, 1993; Saunders and Clark, 1992; Cragg and King, 1993; Igarria et al, 1997; Clarke 1991, 1992) and this usually limits their ability to receive the full

strategic benefits of the technology. SMEs frequently have a short-term strategic view and generally lack the specialist skills, the understanding or resources when it comes to using or implementing any innovation when compared with large enterprises which may have whole departments five or six times bigger than the small business (Behredorff and Goldsworthy, 1996).

This finding is consistent with past research (Iacovou, Benbasat and Dexter, 1995; Raymond et al, 1989; Blili and Raymond, 1993; Cameron and Clarke, 1996; MacGregor et al, 1998; DeLone, 1988; Igbaria, et al, 1997) that found organisational resources to be influential in the adoption of IT. Clarke (1991, 1992) identified lack of organisational resources as a specific impediment to the widespread adoption and usage of the Internet. Surveys conducted recently have found similar barriers to Internet use in small businesses. For example, the majority of SMEs have fewer resources to deal with security and liability problems; they also have limited access to both information and expertise in the area of e-commerce (<http://www.johnmcguinness.com/ecommerce.html>). A related theme that emerged from the case interviews was lack of confidence in investing in Internet commerce, especially when there are other investments that could be made with more certain return success.

The financial resources refer to the finance available for SMEs to pay for their Internet connection, installation, maintenance costs and implementation of any subsequent enhancements, and ongoing expenses during usage (such as communication charges, usage fees). *The case result shows* that some SMEs described having to prioritise the spending of their scarce monetary resources. MGL reports that lack of financial resources delayed them in the establishment of their web site.

Although the expense involved in setting up the Internet can be as low as a few hundred pounds (e.g., for Internet software running on a personal computer), an Internet commerce system integrated effectively with other in-house systems (e.g., Intranet, electronic payment systems) will cost much more. Because integration of the Internet to other internal applications is necessary for successful Internet investments, one can easily see the importance of financial resources. The majority of SMEs do not have the technical expertise or resources needed for such integration. Furthermore, the

relatively low computerisation level of the operations of SMEs makes the integration of sophisticated information systems (such as the Internet) difficult, necessitating costly expenditures. Usually, SMEs with available financial resources are better equipped to adopt and use the Internet in business and consequently are more likely to enjoy higher benefits from the use of the Internet.

Technological resources refers to the level of sophistication of IT resources available in an organisation. SMEs that emphasise information management and boast sophisticated IT team are usually less likely to feel intimidated by the Internet and its jargon. Also SMEs that possess a superior corporate view of data as an integral part of overall information management, and have access to the required technological resources (i.e., hardware, software, expertise) will expedite Internet adoption (Pare and Raymond, 1991). SMEs with adequate or high financial and technological resources will be better prepared and able to undertake a complex innovation such as the Internet, and thus reap the benefits of its use.

#### *6.2.3.3 Organisational size*

The case evidence shows that size of SMEs is an important factor in the adoption and usage of the Internet. Due to the size of an organisation a certain critical mass (Markus, 1987) may be present, which justifies the adoption of particular innovations. For large organisation there may be a greater necessity to adopt some innovations than for smaller ones. This is not surprising because size, especially in financial measures indicate the resources available to larger SMEs than smaller ones. The medium businesses in the survey phase of this research presented in chapter 5, adopted and used the Internet more than the smaller businesses.

The case study findings support others (Lymer, Nayak, Johnson and Spaul, 1998; Levy and Powell, 1998; DTI, 1998; Igbaria et al, 1997; DeLone, 1988; Raymond, 1985) which found that size of business is a key factor in the general adoption of computer technology. DTI (1998) survey found that large companies have higher levels of ownership of hardware and infrastructure than SMEs, with (99%) of large companies owning computers compared to (74%) of SMEs companies. The survey also showed (52%) of SMEs continues to be 'indifferent', 'uncertain' or 'antagonistic' towards the information age.

Although firm size was not included in Iacovou, Benbasat, and Dexter's (1995) model, they found size to be closely related to adoption of EDI. In addition, the survey of Internet use by North American businesses (<http://www.ora.com/survey/business> -conducting business on the Internet, 1996, O'Reilly & Associates) found that the proportion of business with over 100 employees connected to the Internet was several times greater than that of small companies. Another study carried out by PFA research into the usage and uptake of ICTs by European SMEs found that there were significantly different levels of uptake in the use of the Internet between medium and small businesses. For instance, 41% of companies with 50 employees and over were using the Internet while only 16% of companies with less than 50 employees use the Internet.

#### **6.2.4 Environmental factors**

Environmental factors are those changes in the business environment that create threats as well as opportunities for an organisation and are usually beyond the control of management of individual SME. The two categories that emerged as being influential on the adoption of the Internet are competitive pressure and external pressure from trading partners.

##### *6.2.4.1 Competitive pressure*

Competitive pressure refers to the level of Internet usage of the SMEs' industry and, most importantly, to that of its competitors. The case result shows that few of the SMEs started using the Internet because of the perception of increased competition within and from other industries. These SMEs interpreted the pressures as threats to their competitive position and their profitability ratio. This is the view expressed by four of the SMEs (AL, FP, BPC and CLR), these SMEs are more Internet literate and they need to 'show-case' their expertise to existing and potential customers. The nature of their business also means that IT can help them to be more effective in their operations.

Information is clearly a tool of key strategic value for SMEs, the Internet can significantly alter the way business is conducted by improving business functions such as communication, marketing and customer service (Bloch and Segev, 1996).

The Internet plays an important part in achieving competitive advantage, as its underlying core issue is information: the ability to transmit, obtain and process information fast and with low cost in relation to other means. Its use holds the potential for SMEs to access new markets and overcome the barriers traditionally associated with conventional commerce. Internet technology provides a relatively low-cost alternative for SMEs not only to advertise globally but also to find suitable business partners and suppliers around the world. SMEs can use the Internet to differentiate their products or services they provide to their customers. The Internet deletes distance as a barrier and thus presents a unique opportunity for SMEs as they can tap into pools of information previously unavailable. It offers several opportunities that can turn into organisational advantages if they are combined with an appropriate business strategy (Clark and Stoddard, 1994).

The Internet is a great marketplace for building customer relationships and customising offerings for individual customer (Hoffman and Novak, 1995). The use of the Internet allows SMEs to be more responsive to customer needs. Chatterjee and Sambamurthy (1999) point out that the interactive capability of the Internet enables SMEs to provide better customer service and also to tap their existing and prospective customers for ideas to differentiate their individual products and services through quality features, brand name and packaging. The customer interaction facilitates relationship marketing and customer support to a greater degree than ever possible before with traditional media, and new customers can be secured in way formerly restricted to much larger firms (Burgess and Cooper, 1999).

However, Reynolds (1997) argues that having an Internet presence is not a source of sustainable competitive advantage as the technology can easily be copied. Reynolds suggests that there are two strategic uses. First, the Internet can be an information medium for new products and services. Second, it can be used to provide value-added services that can not be easily provided otherwise. Zuboff (1988) reports that the Internet may be used to add value to business process, providing them with a kind of emergent property, that of generating information about the underlying productive and administrative processes through which an organisation accomplishes its work. Porter (1980, 1984) identifies five competitive forces: new entrants, threat of substitute, bargaining power of customer, bargaining power of suppliers, and rivalry

among current competitors. Porter suggests that, by adopting IT, businesses will be able to change their competitive environment in three ways: by changing the industry structure, altering rules of competition, and giving businesses new ways to outperform their rivals.

Although none of the SMEs in the examined cases set out to gain competitive advantage from their use of the Internet. However, after being slow to adopt the Internet, the director of FP considered it necessary to have high quality IT in order to compete effectively. The director wanted to use the staff more effectively and saw the Internet as an enabling technology that could make the firm flexible and profitable. The nature of products also appears to have an effect on Internet adoption. Most often SMEs and their customers use the Internet during the product acquisition and delivery stages. This is particularly important for CLR, the firm invests more in systems which enables them to acquire and deliver products more effectively. CLR sets up an electronic delivery service to cut costs in the delivery of their products to customers.

The case evidence suggests that some SMEs are jumping on the Internet bandwagon to maintain their competitive positions.

MGL reports: "We started to use the Internet because we felt that more and more people are using the Internet so we decided it is time to do something about it. As you know to compete in today's competitive market, organisations have to follow the trend and join the Internet revolution".

AL explains: "... one of the main reasons that encouraged us to use the Internet is because almost every other company in the world is using it. We are interested in both growing our existing business (increasing market share) and streamlining our operations by cutting costs and redesigning business processes. And also there was a heightened recognition among senior managers that information systems were critical to running the business and that these should be more effective. Therefore, using the Internet to gain competitive advantage became a general corporate strategy".

SAH reports: "We started to use the Internet just to keep in line with the way information technology is going because we do not want to be left behind. If we do not join the Internet revolution or follow the crowd, then we will miss the advantage of the Internet, if there is an advantage to be gained at all. We use the Internet to provide information to the general public and to publicise the activities of the hospice".

The case result is consistent with previous research on IT (Robertson and Gatignon, 1986; Porter, 1980, 1984; Frambach, 1993; Cragg and King, 1993) that found

competitive pressure as being of influence on the innovation adoption decision. Robertson and Gatignon (1986) proposed an extended behavioural paradigm of technology diffusion among organisations in order to incorporate competitive effects on the diffusion process in the extant paradigm outlined by Rogers (1983). They found that a variety of competitive effects in the technology adopter's industry (competitive intensity, demand uncertainty) and within the technology supplier's industry (level of competitiveness, reputation, and technology standardisation) impacted on the rate of adoption and level of diffusion of high technology innovations.

Additionally, economists generally hold that competition increases the likelihood of adoption of innovation (Gurbaxani and Mendelson 1990). A high level of competition among firms in a certain industry may enlarge the pressure on an individual SME to adopt certain technological innovation. As more competitors and trading partners adopt and use the Internet, SMEs are more inclined to adopt and use the Internet in order to maintain their own competitive position. In cases where firms do not do so, they may find that the adoption of that specific innovation by other firms may create a competitive disadvantage for it (Frambach, 1993).

#### *6.2.4.2 External pressure*

External pressure refers to influences from the organisational environment, for example an imposition from trading partners. A few SMEs report external pressure as a very influential factor into adopting and using the Internet in business. In three cases (BIL, MGL and BPC) external influences affecting the adoption included the Internet's increasing popularity and the rising number of Internet users. Two of these SMEs (BIL and BPC) reported being pressured to adopt and use the Internet in business.

BIL reports: "We started to use the Internet because we were asked to use it by our trading partner (Peugeot manufactures), and as a dealer with them, we have no choice but to start using it or risk losing our dealership".

MGL reports: "We started to use the Internet, because we think the Internet is getting popular and there are more and more people connecting to the Internet every day".



BPC reports: "... the need to adopt more technology was far out-distanced by the fact that unless you appear to be installing the latest technology and keeping it or you will be in danger of losing your clients, which we feel is a form of commercial blackmail".

The case result shows that the adoption and use of the Internet seems to be prompted by external pressure rather than by a serious business decision. This is in line with other studies (Iacovou, Benbasat, Dexter, 1995), which found external pressure as the strongest explanatory variable influencing small businesses to adopt EDI. Iacovou, Benbasat and Dexter (1995) indicated outside pressure from trading partners to be the main reason SMEs become active in EDI. They revealed that a firm's decision to adopt EDI "is primarily based on what its business partners are doing and not on the characteristics of EDI". Indeed, more than 70 percent of the respondents in their survey identified customer pressure/mandate as one of the primary reasons for adopting EDI. The pressure from large trading partners is especially significant and influential in the case of EDI because of the need for networking between them (Iacovou, Benbasat, Dexter, 1995). Levy et al (1998) found that principal customers are important in EDI adoption, mainly due to collaborative relationships. Tuunainen and Saarinen (1997) found in their studies that usually small businesses have used EDI in a way that was originally established by their principal customers and they have not used the technology because of the opportunities it offers them or as part of business strategy.

The imposition from trading partners is one of the most critical factors for Internet adoption by SMEs; as the weaker partners in inter-organisational relationships, SMEs are extremely susceptible to impositions by their larger partners (Saunders and Hart, 1993; Iacovou, Benbasat, Dexter, 1995). Kurnia and Johnston (2000) found that customers and suppliers continue to have a big impact on decisions to adopt and invest in technologies. Lymer et al (1998) found in their study that the impetus for SMEs adopting electronic commerce had come from a customer wanting to use this form of technology for transaction. DTI (1998) revealed that customer influence has been particularly important for a number of SMEs adoptions of ICT.

One of the interviewee in DTI survey reported: "our customers have been quite a big influence in our take up of IT. If the customer insists on us having EDI, then we really have no choice but to take it and this has been the case with six of our customers. Without having the EDI system, for example, a big company like Tesco would be

unwilling to trade with us. There are cost implications, but by and large if a client suggests that we get some form of technology then we tend to get it”.

This confirms the weak market positions of most SMEs. The external pressure by trading partners is also in concordance with critical mass theory, the symbolic interactionist and social information processing theories (Fulk et al, 1987). These theories address the role of SMEs' perceptions of their environment and social influence in the adoption of innovation. Golden et al. (1992) found external pressure as components of critical mass and social interaction were found to be positively associated with IT usage.

Internet and information technology generally is placed low on the priority lists of most SME owners/managers. Experience has shown that without a direct demand from a major customer, introduction of IT is more likely only when other priorities do not interfere with the process (Behredorff and Goldsworthy, 1996; Tuunainen and Saarinen, 1997; Levy and Powell, 1998). Most SMEs have more pressing concerns about finances, economic survival and getting through day to day problems. Unless major trading partners are insisting upon adopting new technology, there is limited motivation to introduce technology for its own sake. It is not surprising, that requests from powerful partners (e.g., ones that consume a large proportion of sales or generate a large portion of the SMEs' profits) to start using the Internet are expected to be more influential in the adoption decision of SMEs than similar requests from less powerful partners. SMEs, particularly smaller ones, are more vulnerable to external pressures and more likely to comply with the demands of their powerful trading partners than larger counterparts. This indicates that the retention of a major customer may be sufficient reason to adopt IT with any net cost treated as a cost of staying in business.

The case study findings support others (Iacovou, Benbasat, and Dexter, 1995; Behredorff and Goldsworthy, 1996; Tuunainen and Saarinen, 1997; Levy and Powell, 1998; Poon and Swatman, 1998; D11, 1998; Golden et al, 1992), which found that SMEs have traditionally used information technologies in their business as a reactive measure in response to requests by larger organisations who are customers and therefore provide the business imperative for them to become IT compatible. These

large companies have access to resources and investment capitals, which are not generally available to SMEs. Research has also shown that firms that implement IT based on mere hype or have been forced by trading partners rather than genuine task needs, may not feel the necessity to significantly diffuse it (Behredorff and Goldsworthy, 1996).

### ***6.2.5 Barriers to Internet adoption***

The Internet is a great marketplace for building customer relationships and customizing offerings for the individual customer (Hoffman and Novak, 1995). However, there exist barriers to both customer and firm adoption (Lim et al, 1998). Barriers to Internet adoption are obstacles, which prevent or inhibit SMEs from adopting and using the Internet in business. Overcoming these barriers is a key factor critical to adoption and use of the Internet. The issues of Internet adoption that emerged from the case study analysis covered a broad range of barriers. The analysis of the result suggests that some of these barriers may be more perceived than real. These barriers are categorised as follows: security of information, lack of knowledge, complexity of integrating the Internet with the internal application systems, cost of investment, limitation of infrastructure, limitation of personal contact with the customer, uncertainty about the Internet value in business and lack of universal electronic payment systems.

#### ***6.2.5.1 Security***

The main stumbling blocks to Internet adoption are the (perceived) insecurity of Internet, the problems brought about by cashless payments, slow connection times and limited access and information overload (Cockburn and Wilson, 1996). The riskier an innovation is perceived to be, the lower the chances of its adoption. Correspondingly, if customers are uncomfortable with purchasing products over the Internet, reckoning it to be unsecured, virtual stores will not be able to attract businesses. Presently, the use of the Internet as an accepted technology has been hampered by the lack of security, either real or perceived (Bloch and Segev, 1996).

Security issues were highlighted as an important factor hindering adoption and use of the Internet. The concern over security issues varied across SMEs. The case result suggests that three of the SMEs (AL, SAH and MGL) dealt with highly sensitive

client data and therefore security of information was a critical business issue that affected their use of the Internet. They expressed their concern about security of information as a major problem and in certain respects as an obstacle to using the Internet for conducting business. Security concerns were expressed in terms of privacy, trust and unauthorised access and enhanced vulnerability to hackers and computer viruses.

MGL reports: "The security of the Internet is still the main problem preventing people from using the Internet, we are still a little bit unsure on sending confidential documents over the Internet. For example, in June 1999 Microsoft email system was closed down because of a breach of security, people were having their email read, and things like easy access to other people's information, that worries us. And also you hear so many stories of I've given my credit card number and somebody else has used it. It is probably not founded but it does make you think about using the Internet".

SAH reports: "We are very concerned about security of information over the Internet, we are not convince that the Internet is secure enough to prevent personal information falling into the wrong hands". AL made a similar observation about security of the Internet, "we recognise security of information as a major issue, and in certain respects it is an obstacle to using the Internet for certain transactions. As a business, we have to maintain commercial confidentiality and secrecy over some of our specifications, until we are happy with the level of security offered. We might not be happy to send specifications of our machines over the Internet with the present level of security, we would not want our competitors to know the necessary details that they could copy it".

The remaining SMEs report little concern over security issues as they operated in environments where little of the data they routinely handled required particularly secure environments. Only CLR was actively conducting transactions and taking money over the Internet and therefore some elements of their data transmission requires secure environment. SMEs were all in agreement that security of the Internet was still the main problem preventing them from fully utilising the Internet, including SMEs that have not really experienced any problem with security. This finding is consistent with previous research (Clarke, 1996, 1997; Neches et al, 1994; Schofield, 1997; Cerf, 1998; Lane, 1998) which found security of the Internet as a major barrier to adoption and usage of the Internet. A survey conducted by KPGM Consulting (1999) over a sample of 357 European companies found similar barriers to Internet usage as concern about security, insufficient skills and lack of knowledge of the potential benefits.

Clarke (1997) argues that the question of trust is even more prominent in the virtual world than it is in the real world. Schofield (1997) notes that confidence and trust is an essential requirement for secure electronic trading. Skevington and Hart (1997) also argue that the move to electronic commerce challenges many of the basic assumption about trust. The geographical separation of buyers and sellers, often coupled with a lack of real-time visual or oral interaction, creates a number of concerns. The sheer number of people conducting business on the Internet becomes a deterrent. When you find potential partners, do you trust these sellers or buyers to be reliable, their products to have satisfactory quality, and payments to be truthfully carried out?

The case study evidence suggests that security of the Internet might be more a problem of perception than reality. It is more the 'mindset' which inhibits for example the use of online credit card payment. Consumers fear that their financial information may be manipulated and misused either by the intended recipient of a credit card number or by a hacker who may intercept the card number before it reaches its final destination. Bloch, Pigneur and Segev (1996) lend support to this finding; they point out that many specialists consider security to be a matter of perception rather than reality. Similar findings were reported by Forester research, which showed that concerns over Internet security might be exaggerated. Nevertheless, customers' perceptions are really what matters in terms of new technology adoption. According to Currie (1998) overcoming the psychological barriers towards Internet security could be more difficult than overcoming the technical challenges.

It is important to realise that until the problem of transaction security is completely resolved, companies and consumers will be uneasy about performing financial or other confidential transactions online and reluctant to use the Internet for conducting business. Addressing security issues thus is a necessity in order to build trust and confidence in the electronic marketplace. Therefore, for the Internet to be used as a global market place or judged as suitable for commerce, business transactions must be completely reliable and secure. This is critical to mass adoption of the Internet, especially since surveys of web users indicate that reliability and security of financial transactions are important to users (LTI, 1998; [http://www.cc.gatech.edu/gvu/user\\_surveys/](http://www.cc.gatech.edu/gvu/user_surveys/)). The level of relative concern with

security appears to decrease as firms become more advanced and gain understanding of security issues and the appropriate technologies to address them.

#### *6.2.5.2 Lack of Internet knowledge*

Internet knowledge is the knowledge SMEs possess about the business and strategic issues within the firm, and the potential opportunities for applying the Internet within their business domain. While the lack of Internet knowledge refers to the lack of broad knowledge and understanding of the Internet, this is seen as a significant barrier to the use of the Internet in business. SMEs generally do not have the skills, understanding or resources to train their employees on the use and potential benefits of using the Internet, especially smaller companies. The case result shows that the lack of Internet knowledge discourages some of the SMEs from exploring the potential opportunities that the Internet offers. Two of the SMEs made it clear that non-of their employees were knowledgeable about how the Internet works, therefore, it is difficult to use the Internet without understanding how the technology works. At BIL, the owner's low level of Internet knowledge discouraged other staff from exploring possibilities. The evidence shows that SMEs with little or no knowledge of the Internet experienced difficulty in making judgements of its potential uses and were inhibited from fully exploiting the Internet potential.

MGL reported that their company viewed the Internet as a useful business tool, but were unable to exploit it as fully as they could, because they lacked the expertise within their company to understand how the Internet and its technology works. SAH acknowledged lack of understanding Internet technology as a barrier hindering them from full exploitation of the Internet in business. The SAH manager believes that all the good personnel are going to the large companies, because most SMEs do not have the ability and the resources of the large organisation to attract qualified staff. This problem may be especially acute, or at least noticeable, when this includes SMEs that are charitable organisations or small businesses as opposed to larger businesses. The relatively low understanding of Internet technology makes the full exploitation of the Internet difficult, and thereby their ability to receive strategic benefits from the use of the Internet is limited.

The case study results clearly indicate that Internet knowledge and skill facilitate Internet use and it is crucial in influencing SMEs decision to adopt it in business. The findings is consistent with the broader IT adoption and implementation literature (Boynton, Zmud, and Jacobs, 1994; Cragg & King 1993; DeLone, 1988) that have found lack of knowledge as an inhibitor to adoption and use of information technology. Schmitz and Fulk (1991) argue that SMEs with little experience or knowledge will have difficulty making judgements of its richness and may be inhibited from exploring the potential of the Internet. Hamill and Gregory (1997) indicate that by far the most important barrier preventing greater use of the Internet is lack of knowledge concerning the Internet 's capabilities and how to use it effectively. They found that more than (70%) of their respondents who expressed an interest in using the Internet stated that limited knowledge and experience were the most important barriers to Internet adoption. Boynton, Zmud, and Jacobs (1994) reported that a good understanding of the benefits and opportunities that the Internet can offer to SMEs could influence their decision to adopt and use the Internet. They found that managerial IT knowledge is a dominant factor in explaining high levels of adoption and IT use in organisations.

Schmitz (1988) provides confirmation of positive relationships between electronic mail use and medium expertise/knowledge that may reflect increased electronic mail familiarity. Although Schmitz found that electronic mail use varied inversely with computing experience, usage was positively related to electronic mail experience and skills (Schmitz, 1988; Fulk, Schmitz, and Steinfield, 1988). In the study of the determinants of success for computer usage in small business, DeLone (1988) found that chief executive knowledge of computers leads to more successful use of computer in small business. Similar findings was reported by Oftel (2000) survey, which found that (31%) of the survey participants indicated that they lacked knowledge on the equipment needed for the Internet and how to use it. The survey found that lack of knowledge of computer equipment and cost of equipment were a deterrent to use of the Internet. DTI (1998) survey showed that (36%) of all companies surveyed felt that their employees didn't have sufficient understanding of Internet technology and only (33%) of UK companies give their employees training 'frequently' or 'quite often'. Cragg and King (1993) found that economic costs and lack

of technical knowledge were two of the most important factors that hindered IT growth in small organisations.

#### *6.2.5.3 Complexity*

The complexity of the Internet depends on the degree of relative difficulty in understanding and using it (Rogers, 1983) and integrating the Internet with the various internal applications. The case result shows that generally many SMEs do not have the skills, the understanding or the resources to investigate the myriad of alternatives for using the Internet or trading with business partners. In addition, the lack of ownership makes the Internet a complex technology to manage and its use presents a significantly open and flexible environment that is vulnerable to misuse, not least hackers, viruses and unauthorised access.

BIL reports: "The Internet technology is too complex and not well understood without enlisting the help of an expert. We believe that the Internet may increase the complexity of our business systems rather than facilitate positive change".

The use of the Internet for advertising purposes is relatively simple and straightforward. However, extending its coverage to direct sales with different payment modes introduces extra handling involving a variety of hardware and software. Furthermore, integrating the Internet with the various internal applications also increases the level of complexity by several orders of magnitude, such complexities inhibit SMEs from adopting and using the Internet.

Complexity has been consistently observed to inhibit innovation adoption and lead to greater difficulty in its implementation and diffusion (Cooper and Zmud, 1990; Kwon and Zmud, 1987; Rogers, 1983; Tornatzky and Klein, 1982; Frambach, 1993; Clarke, 1991, 1992). Cooper and Zmud (1990) found that manufacturing resources planning (MRP) adoption is more likely to occur when a firm's environment is characterised as low complexity. Rogers (1983) generalised it to be negatively related to its rate of adoption. Clarke (1991, 1992) found complexity of Internet technology as a specific barrier to the widespread adoption and usage of the Internet in organisations.



#### 6.2.5.4 Cost of investment

A frequently cited barrier is the high investment cost associated with the introduction of innovation in organisation. Costs were often the first element considered when evaluating the use of the Internet because of SMEs' limited financial resources (Cragg and King, 1993; Raymond et al, 1989; Blili and Raymond, 1993; Cameron and Clarke, 1996; DeLone 1988; Igbaria, et al, 1997). These financial constraints mean that SMEs may have difficulty in investing in new technologies even if they know that it can provide benefits later. The cost of investment in IT had been justified on the basis of 'if we don't we will get left behind or we need to get the equipment to project a professional image to the clients'. SMEs are likely to be more price sensitive towards IT investments than larger, more established companies. This is partly a reflection of the fact that larger companies are more likely to have the financial capability to invest in IT whilst small businesses are more wary of committing their limited funds.

The cost of introducing new technology and training the employees on how to use it can be very high for most SMEs. The cost of the initial set up emerged as a barrier for some SMEs that already had an Internet (SAH and MGL) connection.

SAH reports: "The cost of using and maintaining the Internet was too high. Cost of using the Internet is a major obstacle to SMEs becoming fully involved in electronic commerce. It did cost money to introduce the Internet in the first place and it takes a lot of time and money to train the staff to understand how to use the Internet". While MGL reports that cost was the main reason for the delay in developing their web site.

The training of staff on the use of the Internet and integrating it with other internal applications often requires modifications or even development of new applications thereby adding significantly to the initial cost. And also, because major changes to organisational work procedures can result as a consequence to extensive internal usage of the Internet, a sizeable and continuing investment is necessary to educate and train staff to make effective use of the Internet (MacGregor et al, 1998).

These findings are consistent with previous studies (Tornatzky and Klein, 1982; Bakos, 1991; KPGM, 1999; OECD, 2000; DTL, 1998; Pfeiffer, 1992; Clarke, 1991, 1992) which have found cost of investment as a barrier hindering adoption and use of the Internet. The cost of an innovation is assumed to be negatively related to the

adoption of innovation (Tornatzky and Klein, 1982). KPGM consulting (1999) has noted the high cost involved in the start-up and maintenance of electronic commerce systems. Indeed, some of the companies interviewed by DTI (1998) frequently cited perceived costs of investments as a barrier to uptake of ICTs. The citing of cost as a barrier could possibly indicate that some SMEs are not convinced that the cost of setting up and maintaining a web site would outweigh the benefits of it. As was indicated by one of the SMEs "there is a fine line between the time and cost that you spend to set up the system and the profit that you have at the end of the day".

#### *6.2.5.5 Limitation of infrastructure*

The case result shows that a few of the SMEs expressed some concern regarding Internet infrastructure. Two of the SMEs (CLR and FP) report technical problems, largely related to the limitation of Internet infrastructure, as a barrier hindering the full exploitation of the Internet in business. The limitations of infrastructure were noted by almost all the SMEs, even those that had not experienced these problems themselves. Those SMEs that encountered technical problems felt strongly about the issue.

CLR reports: "The limitation of Internet infrastructure does restrict us to what we can communicate to our customers or put on the web site. We have got very interesting footage that we have shot, but we were unable to put it on our web site because of the time it takes for customers to access or download it". This view was repeated by FP, which stated that "it's sometimes frustrating because of the time delays involved. You click on a link and then it takes forever to get to the next page, when you finally get there you find that it's not really useful to you anyway".

The case study finding is consistent with previous studies (DTI, 1998; Clarke, 1997; Fuller and Jenkins, 1995). Fuller and Jenkins (1995) reported that technical problems concerning connectivity was an important, if not actually critical factor for success. These technical problems can become potentially insurmountable barriers for small businesses wishing to use the Internet for business activities and operations. Speed of the Internet is still, however, the most significant problem with (50%) of people interviewed by DTI (1998) dissatisfied with how long it takes to download pages with graphics. There is also the uncertainty as to the robust nature and longevity of the existing infrastructure. The existing telecommunication infrastructures are too slow to warrant a full-scale commerce on the Internet (Clarke, 1997).

#### 6.2.5.6 *Uncertainty about the Internet*

The case results show that the Internet creates additional levels of problem including a lack of understanding (as few of the SMEs admitted that they know so little about how the Internet works); fear generated because it involves new and emerging technologies; confusion generated by mixed messages about the effectiveness of the Internet for business improvement. The population of Internet users is unknown and difficult to gauge, thus generating uncertainty, which in turn causes SMEs to be hesitant about Internet commerce investments. The case shows that a few of the SMEs are not convinced that there is a good business or economic reason to use the Internet and do not know whether the usage can be cost justified in either the short term or long term. The concern about the value of using the Internet in business was evident in two of the SMEs (BIL and BPC). These SMEs report that they need information on how the Internet can benefit businesses and how to use it.

The owner of BIL shows reluctance and lack of interest, for him the attitude as barrier was lack of conviction about the value of using the Internet in business. He indicates that his company is not totally convinced about the value of using the Internet or nobody has convinced him that the Internet is the answer to every business problem.

"We really need to be convinced about the potential of using the Internet in business. Over the years there have been many things that are supposed to do this, that, and the other and you get involved and it does not work out the way you have been told". Likewise BPC reports: "... no business was making money from using the Internet. So much of the Internet is hype; I have yet to know a single UK company that's making a profit out of purely it's Internet operations. For example, Amazon.com is losing 100 million pounds a year and they are still in business, this is because it's a wall street share option a two dollar share in Amazon.com eight years ago is now worth 1300 hundred dollars".

Their cynicism about the value of using the Internet in business has been vindicated by the recent news about businesses trading on the Internet. Indeed, as enterprises large and small scrambled to stake their presence on the Internet, hopes were high that once that is done, the whole world will come knocking. To date, this has rarely been the case. One of the disturbing realities of Internet commerce today is that while the overall number of transactions, orders and sales revenues are still rising rapidly, many of the online businesses have failed to turn a profit, e.g. lastminute.com the last minute holiday online booking company is losing millions of pounds and recently boo.com has been declared bankrupt.

While there is considerable rhetoric about the value of doing business on the Internet, Levy and Powell (1998) report that it is less clear that the Internet provides much value for businesses either in market share or profitability. They indicate that companies are unsure of how to measure the number of people on the Internet and how many people are actually using it and this uncertainty makes investment decisions difficult. Lymer et al (1998) argue that the Internet is still at an experimental stage, so companies have little experience to draw upon for translating the much-hyped benefits of the Internet into financial and competitive advantages for their businesses. KPMG Consulting (1999) survey found that the unavailability of an established business model for the Internet is indicated as a significant problem for SMEs, which find it difficult to re-organise their business to fully exploit the potential of the Internet.

These uncertainties about the Internet have led some SMEs to question the viability of the Internet as a commercial medium; not least the lack of established criteria for judging the success of Internet use in business. The need for such established standard criteria are critical to demonstrate to SMEs the viability of the Internet as a commercial medium, and provide mechanisms for measuring investment opportunities and business success (Hoffman et al, 1995). This finding is consistent with DTI (1998) survey, which found barriers to introduction and use of new technologies in SMEs include the difficulties in quantifying future benefits when assessing the business case for using these technologies. Thus, a theme emerging from the interviews was the lack of confidence in investing in electronic commerce, especially when there are other investments that could be made with more certain return success.

#### *6.2.5.7 Limitation of personal contact*

The result shows that the reduction in personal involvement with customers is of concern to a few of the SMEs. Although all the SMEs agreed that using the Internet has made communication more efficient, it nevertheless was viewed as the primary medium for building and maintaining interpersonal relationships with people located at a distance. A few of the SMEs expressed concern (particularly the smaller companies) on the impact of using the Internet on their co-workers and the reduction in personal involvement with customers. They believe that their relationships with co-

workers have become cold and impersonal because they communicate exclusively in email. Most SMEs acknowledged that face-to-face contact is irreplaceable. BIL remarks that "you can't replace going to see people, you can't beat having face-to-face interaction for selling products". While CLR comments that "you don't build up a rapport with someone if you email him or her all the time; it's when you speak to them". They indicate that typing (email) into the computer was not the same as speaking face to face with someone. The telephone, they thought, did not have this drawback, and it was believed appropriate, even necessary, to use the telephone to prevent negative social outcomes.

The limitation of personal contact with customers stated as a barrier to using the Internet may be a reflection of SMEs, which may prefer more direct and individual contact with their customers. There is still a suspicion of Internet technology that is perceived to remove human interaction with customers. These findings are consistent with the literature (Pigneur and Segev, 1996; Abell and Lim, 1996). Bloch, Pigneur and Segev (1996) argue that decrease in human interaction with customers could lead to less understanding of the customers needs, as they are not always able to express comments, criticisms or request for new products while interacting with machines. Abell and Lim (1996) report that significant numbers of SMEs are in service industries and rely substantially on personal contact to build confidence with their customers, particularly when the relationship is in the establishment phase.

#### *6.2.5.8 Lack of universal electronic payment systems*

Tightly linked to the problem of Internet security are the problems of payment and the development of suitable payment systems (e.g., digital cash). As long as technology companies, software makers, banks and major credit card companies have not come up with a common protocol to ensure safe financial transactions over the Internet, many problematic issues, such as the vulnerability of credit-card numbers to theft, remain an inhibitor (Lim et al, 1998). Apart from CLR that uses the Internet to sell their merchandise (the company receives about 60% of their orders from the Internet), non-of the other SMEs use the Internet for financial transaction purposes (that is collecting money over the Internet). Rather, all the other SMEs use traditional transaction methods (i.e. cash, cheques and customer accounts) to receive money from their transaction over the Internet. The experiences of the case SMEs indicate that

unless there is a clear advantage over traditional transaction mechanisms, the Internet payment systems will not be favoured, mainly because of lack of trust and security of the Internet.

These findings are consistent with the literature (Fariselli et al, 1997; Poon and Swatman, 1999; Pigneur and Segev, 1996). Fariselli et al (1997) report that one of the reasons believed to be impeding the widespread uptake of the Internet for SMEs commercial activities is a lack of widely adopted transaction mechanisms. This is also reflected in the slow rate of uptake of Internet-based financial transactions among SMEs. Therefore, financial institutions need to build a strong case to SMEs why Internet-based financial transactions are better than the current methods (Poon and Swatman, 1999). Bloch et al (1996) note that electronic business transactions can only be successful if financial exchanges between buyers and sellers can occur in a simple, universally accepted, safe and cheap way. Various systems have been proposed, some of them based on traditional mechanisms (e.g. credit cards accounts), while others rely on new designs, such as electronic money. The recent agreement between MasterCard and Visa on one security standard for credit card transactions over the Internet (Secure Electronic Transactions (SET)), and its backing by most major software vendors is one step in the right direction (Auger and Gallagher, 1997).

### **6.3 Conclusion**

The chapter has analysed and described the results of the SMEs that participated in the case study. SMEs viewed the Internet as a useful business tool for information dissemination and communication to customers, particularly across geographic boundaries, though there were questions about the ability to do actual business by most SMEs. The result showed that only CLR was actually doing business transactions. The only form of interaction for the remaining SMEs was for the customer to place orders for selected services, with the web site being set up primarily for informational purposes. The evidence showed that SMEs used the Internet for interacting with suppliers, investors, and for electronic commerce transactions (e.g. FP). The perceptions of the majority of SMEs reflected an awareness of the Internet's potential and an understanding of the technical challenges and issues surrounding the Internet. The study has attempted to place the analysis of their experiences with Internet adoption within the broader context of SMEs. The factors that influenced or

inhibited SMEs decision to adopt and use the Internet in business were identified and shown in table 6.1. The next chapter draws the study to a close by discussing the findings with extant theories, and presents the conclusion of the research study.

# CHAPTER SEVEN

## SUMMARY AND CONCLUSIONS

### **Introduction**

The previous chapter has analysed and presented the results of the SME cases that participated in this study. The purpose of this final chapter is to summarise the research process, discuss the findings and present the conclusions of the research study. How the SMEs currently use the Internet and the factors that influence their decision to adopt the Internet in business was the subject of this research effort. In the analysis, the study drew extensively on the field interviews to illustrate and ground the findings. No attempt was made to indicate the proportion of the total number of SMEs that are currently using the Internet but rather to look in depth at a sample of SMEs that are using it and the factors that influence their decision to adopt it in business.

The chapter is structured as follows. The chapter begins by summarising the research process. The discussion section follows, integrating the specific concepts and findings of the field study with insights from the existing theories. The conclusions of the research problem, the contribution of the research and the revised theoretical model are discussed. The evaluation of interpretive research is presented; the implications of the research findings, limitation of the study and further research are discussed. Finally, the conclusion and reflection on the experience of conducting this research is discussed

### **7.1 Summary of research process**

#### ***7.1.1 Summary of thesis chapters***

In this section attention will be given to summarising the main theme of each chapter of the thesis. This research study was concerned with the investigation of Internet use and the factors that influence the adoption of the Internet in business.



*Chapter one* laid the foundation for the thesis and presented an overview of the ideas and issues that formed the basis of this thesis. It presented the research problem of the thesis, which was concerned, with the use of the Internet and SMEs. The study addressed a number of research questions: (1) how is the Internet currently used in SMEs and (2) what are the factors that influence the adoption of the Internet in SMEs. The study adopted a two-phased approach to provide answers to the above questions. Phase one of this study was based on a review of the literature; a survey questionnaire of 400 randomly selected SMEs was conducted across the UK, to elicit information regarding the current use of the Internet in SMEs. The objectives of using the survey were: (1) to describe how SMEs use the Internet (2) to examine the benefits that may be gained from the Internet and (3) to examine some of the possible barriers that prevent SMEs from using the Internet. Phase two of the study was based on the results of the survey questionnaire and further review of the literature.

A multiple case study was carried out with seven SMEs that had previously completed the questionnaire in phase one, to gain a deeper insight into the issues raised in the survey and to further understand the factors that influence SMEs decision to adopt and use the Internet in business. The chapter justified the reason for choosing the Internet and SMEs as the topic of this research. The choice of SMEs as the context of this study was because of the important role SMEs play in the UK economy. They account for more than 50% of private sector employment in the UK and currently are contributing most of the private sector employment growth. It is therefore of importance that insight be gained into the issues affecting the adoption and use of Internet technology in this group of organisations. Furthermore, an understanding of how SMEs use the Internet and the factors that influence their decision to adopt it may provide an avenue for policy-makers and practitioner to influence the rate of adoption of the Internet and consequently, the speed of electronic commerce.

*Chapter two* discussed the Internet and small to medium-sized enterprises which formed the background to this research. The origin, growth, and commercialisation of the Internet and the increasing popularisation of the Internet, largely arising from the development of the web were discussed. The chapter showed that the commercialisation of the Internet was already a reality, given the widespread business presence on the Internet, indeed the bulk of the growth in recent Internet usage has

come from the commercial sector. The demographic of Internet users was presented, revealing the profile of a stereotypical Internet user. The Internet business models were highlighted and the main business applications of the Internet and the competitive benefits that can be derived from its effective use were discussed. The chapter discussed the importance of small to medium-sized enterprises to the UK economy and their contribution to private sector employment growth. The choice of SMEs as the context of this study was justified and the use of information technology in SMEs was described. The distinctive characteristics of SMEs that differentiate them from large organisations were presented and SME use of the Internet and the opportunities it offered them were discussed. The versatility and capability of Internet technology was demonstrated as an ideal platform for SMEs to participate in global markets. The literature seems to suggest that the use of the Internet particularly suit SMEs and the nature of their businesses.

*Chapter three* reviewed existing conceptual models and empirical studies relevant to this study. The discussion in this chapter drew from theoretical perspectives of diffusion of innovation (Rogers, 1983), technology acceptance model (Davis, 1989), information richness theory (Daft and Lengel, 1984, 1986), social influence model of technology use (Fulk, Schmitz, Steinfield, 1990) and an extensive body of research in the field of information systems, IT usage, adoption, implementation, innovation and technological diffusion literature.

*Chapter four* evaluated research methods and described the methodology used to provide data to investigate them. A review of the philosophical assumptions of positivism and interpretivism were examined. A framework for guidance on how to choose research approaches was presented. The application of the specific research methods chosen for this study, which was based on interpretive paradigm and used quantitative survey and qualitative case study, was discussed and the justification for choosing the mixed methodology approach was given. Considerable attention was devoted to the research process, in terms of both the philosophical underpinnings of the research method as well as the practicalities of conducting the study. Details have been provided, which outlined how the data was gathered, when and where the research took place, how the research developed over time, and how the data was

analysed. The limitation of research approaches chosen was discussed and the chapter concluded with the description of grounded theory procedures for analysing data.

*Chapter five* presented the analysis and findings of the survey questionnaire phase of the research. The analysis indicated that among the uses of the Internet, information gathering, communication and advertising were revealed as the most significant according to the surveyed SMEs. Most SMEs cited improved communication, information gathering and better awareness of business environment as the most benefits gained from using the Internet. Most of them believed that Internet capability provided a level playing field on which small firms could compete with larger firms. The Internet was an extremely attractive method for SMEs to expand their markets and reach a global audience. It was seen as an important medium for SMEs to establish and tighten relationships with their customers. The Internet was very useful in gathering information and communicating with suppliers and customers. The use of the Internet for communication (email) was regarded as an additional means of communication, rather than a substitute.

Analysis of the survey result revealed that medium-sized companies were the most enthusiastic about using the Internet and small companies the most uncertain. This was partly a reflection of the fact that medium-sized companies were more likely to have the financial capability to invest in IT whilst small companies were more wary of committing their funds. The survey result showed that size of a company influences the adoption and use of the Internet. The Internet usage was cross-tabulated with ownership of web sites, the results indicated that SMEs with web sites were more active users of the Internet than those without. In contrast, SMEs without web-sites were in the earlier phases of Internet usage and used the Internet to obtain information rather than provide information or conduct transactions.

The survey was compared with two recent surveys carried out in the UK. The DTI and Oftel surveys suggested growing Internet usage among SMEs; their findings lend support to this study which showed that smaller businesses were not adopting the Internet as much as medium businesses. This was mainly due to a focus on cost reduction and improving productivity that can be done through more traditional IT. The DTI and Oftel surveys tend to confirm the proposition that size of company

matters in the adoption of the Internet. The most used Internet resources in these surveys were email and the web. The findings from the DTI survey and the Oftel survey were broadly similar, to the present survey.

Despite the benefits and opportunities available from the use of the Internet, it still has a number of limitations and misconceptions that must be overcome before it could be deemed suitable for commerce especially concern for privacy and security of information. The result showed that the majority of SMEs expressed concern about security of information as a major problem. However, the survey responses appeared to indicate a generally positive attitude towards Internet usage.

*Chapter six* presented the second phase of the study, which was carried out, using multiple case studies. The chapter analysed the SME cases that participated in this study and identified the factors that influenced and inhibited adoption of the Internet. The accounts of Internet usage in the participating SMEs were analysed and described using grounded theory technique. The chapter developed an enriched model from the case study analysis that explained the adoption and use of the Internet in small to medium-sized enterprise. The theoretical model was proposed as an initial formulation of the key factors that influenced SMEs decision to adopt and use the Internet in business. The case study result has shown the factors that influenced the adoption of the Internet in SMEs as technological, organisational and environmental factors.

### ***7.1.2 Review of research questions***

This section returns to the research questions presented in chapter 1 and considers the extent to which they have been answered or altered by the study. The research was designed to yield an empirical examination of Internet usage and the SMEs. In particular, the study investigated current Internet usage in SMEs and developed an enriched model of the factors that influence adoption based on the findings from a theory-driven case study.

#### ***How is the Internet currently used in SMEs?***

This is the primary question to be answered by the survey questionnaire. This phase reported the results of the survey questionnaire examining critical issues surrounding

the use of the Internet in SMEs. The focus was on the current status of Internet usage in SMEs. Some diversity was found in examining the uses of the Internet in business, and these were grouped and discussed in chapter 5. The core categories that emerged from the current Internet usage were: Internet as a medium of communication, Internet as an advertising and marketing tool, Internet as a competitive tool, benefit of using the Internet and barriers hindering its use. These categories represented the areas that SMEs currently use the Internet in business.

The result of the survey analysis indicated that nearly all the SMEs used the Internet for communication and to improve organisational efficiency. The Internet was seen as a means of searching and retrieving global information and a much more 'dynamic' and 'interactive' way of communicating to customers. Its use has made communicating much easier, better and faster. Improved communication and global reach was experienced by all the SME respondents and was regarded as important in generating business. The use of the Internet enabled SMEs to communicate on a global basis with the same ease that larger organisations communicate internally using their internal local area networks. The result indicated that not only was email the most used tool for internal and external communication, it was also one of the most popular methods of advertising to reach a wider audience.

All the SME respondents indicated that the main attractions for using the Internet were its low cost, ease of access to information, interactivity, global reach and its availability at any time. SMEs regarded the Internet ability to lower cost and its ability to reach millions of people globally as a very big advantage. It was seen as a cost-effective business tool to provide information and advertise products and services to the international markets. Its use enabled them to 'reach out' in the presentation of their companies, products and service to a wide audience in a way that no other mechanism could allow at so little cost. The use of web sites was seen as a good way to reach and test new international markets. This was viewed as one of the benefits that the Internet can offer to SMEs particularly smaller companies that cannot afford to develop their business abroad through traditional routes. The Internet was seen and used as a marketing tool rather than a sales channel.

Most of the SME respondents indicated that they used the Internet to provide customer support and it was seen as a useful customer service tool, particularly the web, to provide information about their products and companies. They indicated that customers could get automated support at any time through email and the web. It was regarded as a very useful market research tool to search and gather information and a cost effective means to access global information and to discover new markets and business opportunities. However, the majority of SME respondents expressed concern about security of information as a major problem and in certain respects as an obstacle to using the Internet for conducting transactions. Security concerns were expressed in terms of privacy, trust and unauthorised access and enhanced vulnerability to hackers and computer viruses. A sizeable number of SMEs acknowledged lack of understanding of Internet technology, cost of introducing the Internet, and limitation of infrastructure as some of the barriers hindering the use of the Internet in business.

***What are the factors that influence the adoption of the Internet in SMEs?***

This question is the main thrust of the argument of the case study phase of the research. The case study was used to explain and conceptualise the phenomenon of Internet adoption and to add a richer dimension to the survey data; this was necessary to provide a comprehensive understanding of the factors that influence SMEs decision to adopt the Internet in business. The case study analysis, the results and the conceptual model developed from the case study were presented in chapter 6. The chapter analysed the SME cases that participated in this study and identified the factors that influenced and inhibited adoption of the Internet in business. The data from the case study was analysed using grounded theory technique (Glaser and Strauss, 1967; Strauss and Corbin, 1998). The grounded theory technique developed theory that was grounded in the data; the theory was generated from the data in methodical and purposeful ways as a set of common themes that emerged from the analysis. The grounded theory technique was discussed in chapter 4.

The adoption factors from the SMEs' experiences with the Internet were depicted in figure 6.1. The figure showed the main categories and concepts that emerged as salient from the data analysis, as well as their relationships. The theoretical model was proposed as an initial formulation of the key factors that influenced SMEs decision to adopt and use the Internet in business. The case results showed technological,

organisational and environmental factors as the main factors that influenced adoption and the barriers that prevented adoption. The results of the case study were discussed in terms of the categories that emerged from the grounded theory analysis process.

### ***7.1.3 Review of research methodology***

Given the research study has a descriptive and exploratory focus, a quantitative and qualitative strategy was adopted, which utilised the survey and case study format. The study focussed attention on interpreting the context in which the SMEs currently use the Internet and the factors that influence their decision to adopt it in business. The search of literature shows no empirical studies carried out in this area have used the combination of survey and case study to examine Internet usage in SMEs. Many of the methods that have been used to examine Internet usage in business have traditionally been either survey or case study, and neither of them have managed to provide a full insights into Internet usage and the factors that influence decisions to adopt the Internet. Previous studies that have used survey method to examine the use of the Internet in business included Abell and Lim (1997) while Poon and Swatman (1997) used case study to examine the Internet and SMEs.

This research was unique in that it was the first study to use the combination of case study and survey methods to examine Internet phenomenon in SMEs. The author maintained that in order to find out the current picture of Internet usage in the UK and the factors that influence adoption decision. It was not only desirable but also essential that a different perspective, which involved combining different research methods, be employed to investigate complex and dynamic technology like Internet adoption in SMEs. It was therefore proposed that a combination of these methods were used and the interpretive approach as the paradigm of inquiry, since the approach is concerned with descriptions and interpretation of everyday life expressed in words of those actors involved. The interpretive approach offered an opportunity to conduct rigorous research, which is of direct practical relevance. When supported by case study, the rigour was strengthened and more was discovered of the situations, leading to more knowledge with high potential for relevance to practitioners.

The choice of case study and survey questionnaire methods for this study was important because the combination of these methods enabled the researcher to

examine the Internet phenomenon in a new light. It provided useful complementary information giving valuable insights into the barriers hindering adoption and the use of the Internet. It enabled the researcher to capitalise on the strengths of each and minimised weakness inherent in just using one single research method and also it increased the validity of findings (Gable, 1994; Denzin, 1989). The author argued that the use of survey method alone presented a restricted view of current Internet usage and the factors that influence them to adopt the Internet. The survey method paid little attention to the deeper understanding of the factors that influence adoption of the Internet. No matter how rigorous the analysis, it will not provide a full insight into the current picture of Internet use in SMEs and the factors that influence them to adopt it.

Survey method was used in this study to elicit general information on a group of SMEs giving a comprehensive picture of how SMEs currently use the Internet in business. It was chosen because of its ability to handle a large sample size and a large number of variables simultaneously (Galliers, 1992). The survey seeks to discover relationships that are common across SMEs and hence provide generalisable statements about Internet usage in SMEs. It provided a useful profile of Internet usage in the UK, but it failed to show why SMEs adopted the Internet in business. Although the survey method was very useful in showing how SMEs currently use the Internet, when combined with case study, it was greatly improved, and a complete picture of current Internet usage and the factors that influence adoption was provided (Kraemer and Dutton, 1991).

The case study was used in conjunction with survey to get a deeper understanding of the factors that influence SMEs to adopt the Internet in business. Its use enabled the researcher to elicit qualitative information to complement the shortcomings of the survey method. It was considered particularly useful in understanding the factors that influence SMEs to adopt the Internet, because the use of the Internet in business is developing so quickly and because little was known about the factors that influence adoption in the SME sector at the time data were gathered. It provided a much richer picture of the world than can be obtained from using only surveys (Yin, 1994), which was restricted to gathering information related to the questions on the survey instruments. The use of case study not only provided a means of collecting qualitative data but also good quantity data and it was very useful in the identification of issues



for further investigation (Benbasat et al, 1987). The actual knowledge of what happened in the field provided vital information to challenge and explore some of the assumptions gained from the survey questionnaire.

## **7.2 Discussion of case study findings**

The previous section reviewed the research methodology. This section discusses the case study findings based on the theories presented in chapter 3 and other empirical studies in the literature. The theoretical model was presented in figure 6.1. As depicted in figure 6.1, the categories of technological, organisational and environmental factors were found to be relevant in influencing adoption and use of the Internet while barriers hinder the adoption of the Internet.

The grounded theory approach was useful in developing the theoretical model, because it allowed a focus on contextual elements of Internet usage, elements that are often omitted in IS studies that rely on variance models and cross-sectional, quantitative data (Orlikowski, 1993; Markus and Robey, 1988; Orlikowski and Baroudi, 1991). The comparative analysis technique of grounded theory allowed contrasting the cases on a common set of concepts (see Table 6.2). While the findings of this case study are detailed and particularistic, a more general explanation can also be produced from the results (Eisenhardt, 1989; Leonard-Barton, 1990). The author extended this generalisation by connecting the inductive concepts generated from the case study with aspects of existing formal theories, literature on IT usage, and innovation and technological diffusion, which resulted in a more general substantive theory, a strategy recommended by (Glaser and Strauss, 1967). Eisenhardt (1988) also advocates this approach, noting that an essential feature of theory building is the comparison of the emergent concepts, theory or hypothesis with the extant literature (Eisenhardt, 1989). "Overall, tying the emergent theory to existing theories and literature enhances the internal validity, generalisability, and theoretical level of theory building from case study research" (Eisenhardt, 1988). The outcome is a general conceptualisation of the adoption and use of the Internet in SMEs that both contributes to research knowledge and informs IS practice (Orlikowski, 1993).

The generalisation here is of theoretical concepts and patterns. Yin (1988) refers to this technique as "analytic generalisation" to distinguish it from the more typical

statistical generalisation that generalises from a sample to a population. Walsham (1993) argues that the validity of the inferences drawn from one or more cases does not depend on the representativeness of cases in a statistical sense, “but on the plausibility and cogency of the logical reasoning used in describing the results from the cases, and in drawing conclusions from them”. Walsham suggests that there are four types of generalisations from interpretive case studies: the development of concepts, the generation of theory, the drawing of specific implications, and the contribution of rich insight (Walsham, 1995). The section draws out findings from the same theoretical factors, which have evolved from the analysis process. The theoretical factors of technological, organisational, environmental and barriers to adoption are discussed in relation to the theories presented in chapter 3.

## ***7.2.1 Technological factors***

### *7.2.1.1 Diffusion of innovation theory*

The relative advantage, compatibility and complexity of diffusion of innovation were supported. The result showed that these categories (Internet characteristic) have a strong significant influence on the adoption of the Internet in SMEs. This finding is consistent with diffusion theory and other empirical studies in the literature. Diffusion theory asserts that characteristics of an innovation either facilitate or inhibit the innovation’s adoption. The relative advantage of an innovation, defined as “the degree to which an innovation is perceived as being better than the idea it supersedes”, has been found in research to be one of the best predictors of the rate of adoption of an innovation. An organisation can be expected to adopt an innovation only if it believes that this prospective innovation offers significant benefits compared to alternative choices or the status quo situation. The degree to which an innovation offers significant value to a potential adopter, and the degree of compatibility with its needs and wants, have been identified as important determinants of the success of an innovation (Rogers, 1983). As regards the complexity of an innovation, defined as “the degree to which an innovation is perceived as relatively difficult to understand and use”, Rogers generalizes it to be negatively related to its rate of adoption.

The innovation characteristics put forward by Rogers (1983) were supplemented with considerations of uncertainty about the Internet. This was found to be an important

factor influencing adoption and use of the Internet in the examined cases. Uncertainty about the Internet is in several major ways involved in the adoption of the Internet. Most SMEs are uncertain as to whether the advantages of using the Internet (e.g. cost saving or quality improvement) will be realistic. The extent of the benefit of using the Internet is not known for sure before adoption has taken place. In order to bring the performance of the Internet up to the required or expected level or integrate it with other internal applications, additional efforts, unknown prior to adoption of the Internet, may have to be made. Therefore, the uncertainty surrounding the adoption of the Internet might make a potential SME postpone the decision either to adopt or reject the innovation. The case result showed that most SMEs indicated that they are uncertain as to the emergence of Internet technology standards and the length of the technology life cycle. Such expectations inhibit the adoption and use of the Internet, because potential SMEs may consider the postponement of adoption of the Internet to be the most profitable strategy (Frambach, 1993).

Cost effectiveness of the Internet was found to be influential in the adoption and use of the Internet, this is consistent with the findings of Tornatzky and Klein (1982). They indicated that cost of an innovation is assumed to be negatively related to the adoption of innovation; the less expensive the innovation, the more likely it will be quickly adopted. Ramamurthy and Premkumar (1995) reported that most of the benefits accrued by information technology innovations were often intangible or difficult to quantify. Cost-effectiveness, which measures the perceived benefits relative to cost, may be more appropriate. When innovation is perceived to be cost-effective, organisations will be encouraged to adopt it.

The influence of Rogers (1983) innovation characteristics has found empirical support on a larger scale, as the major factors influencing innovation adoption and diffusion (Kwon and Zmud, 1987; Saunders and Clark, 1992; Tornatzky and Klein, 1982; Cooper and Zmud, 1990). A major result consistent with the predictions of diffusion theory include Cooper and Zmud (1990)'s finding that two innovation characteristics, technology complexity and task-technology compatibility, were positively associated with adoption of MRP. Wolfe (1994) notes that diffusion of innovation has contributed to understanding about factors that predict the rate of adoption of innovation.

Tornatzky and Klein (1982) found 30 innovation characteristics in their meta-analysis of innovation characteristics and innovation adoption implementation. They suggest that compatibility with technology and work practices, complexity, and relative advantage have emerged consistently to be the most important variables predicting adoption of innovation, and there is less support for trialability and observability. Favourable perceptions of innovation characteristics are positively related to adoption of innovation (Davis 1989; Davis, Bagozzi and Warshaw 1989). The studies conducted by Davis (1989) and Davis, Bagozzi and Warshaw (1989) are notable here because the theoretical base for this work is Davis' Technology Acceptance Model (TAM) - itself a refinement of Ajzen and Fishbein's (1980) Theory of Reasoned Action (TRA) - rather than diffusion of innovations. However, as Moore and Benbasat (1991) point out, there are many parallels between TAM/TRA and diffusion theory. For example, TAM's perceived usefulness and perceived ease of use are essentially the same as diffusion theory's relative advantage and complexity.

#### *7.2.1.2 Technology acceptance model*

The perceived usefulness and perceived ease of use of technology acceptance model was supported. The results showed that both perceived usefulness of the Internet and perceived ease of use of the Internet were significant in the adoption of the Internet in SMEs. Davis (1989) model posits perceived usefulness and perceived ease of use as important determinants of system usage. According to this model, SMEs adoption and use of the Internet is driven by the extent to which the Internet is relevant and useful for their tasks. Davis emphasized that perceived usefulness is people's subjective appraisal of performance, and does not necessarily reflect objective reality. The case result showed that SMEs did view the Internet as a useful business tool, it was perceived as useful for both internal and external communications particularly across geographic boundaries and also as an extremely useful tool for information dissemination to customers. Thus, even if an application would objectively improve performance, if users don't perceive it as useful, they're unlikely to use it (Davis, 1989).

Perceived ease of use refers to "the degree to which a prospective user believes that using a particular system would be free of effort". The case result showed that SMEs viewed the Internet as an easy medium to communicate and search for information.

Across the cases SMEs adopted and used the Internet because they believed that it was easy to use and that using it increased their performance and productivity. SMEs may be willing to tolerate a difficult interface in order to access functionality, that is very important, while no amount of ease of use will be able to compensate for a system that doesn't do a useful task (Davis, Bagozzi and Warshaw, 1989). The effect of ease of use on system usage is significant early in the use of the system, particularly in a less sophisticated small firm context; its effect becomes non-significant after more prolonged exposure to the system (Adam. et al. 1992; Davis et al. 1989).

The case study findings support previous observations that noted perceived usefulness and perceived ease of use of innovation as a factor in adopting information technology (Davies, 1989; Davis et al, 1989; Taylor and Todd, 1995). This is also consistent with the views of Rogers (1983) concerning the adoption of innovations in general. Rogers claims that adoption is a function of a variety of factors, including relative advantage and ease-of-use of the innovation. Several investigators have found a significant relationship between system characteristics and measures similar to perceived usefulness (Benbasat and Dexter 1986; Benbasat, Dexter and Todd 1986). Overall, perceived usefulness and perceived ease of use have shown significant associations with outcomes (Gefen and Straub, 1997). Golden, Beauclair, and Sussman (1992) found in their study that user perceptions of the medium's usefulness affects IT use in organisation.

### *7.2.1.3 Information richness theory*

The perceived richness of the Internet was supported. The case result showed that perceived richness of the Internet influenced the adoption and use of the Internet — its ability to facilitate SMEs' task. The theory emphasised the importance of media characteristics in predicting media use, this is similar to Rogers (1983) innovation characteristics and Davis (1989) technology acceptance model mentioned earlier. These theories generalised that medium features or technological characteristics influence innovation adoption in organisations. In this sense, the study confirms the theoretical importance accorded perceptions of media richness as formulated by information richness theory (Daft and Lengel, 1984) and incorporated by the model of

the social information processing of technology (Fulk et al., 1987) and social influence model of technology use (Fulk et al, 1990).

On the other hand, the case result is inconsistent with the prediction of information richness theory which posits that media use is the outcome of objectively rational choices that involve evaluating communication options and selecting an appropriate medium to match the communication requirements of the task. The best medium or an appropriate medium for conducting a particular communication transaction would depend on more than just the features of the medium. The author argues that the richness of the media is not just a property of the media itself, but the Internet can best be understood by considering the social meaning of the Internet for SMEs. This social meaning goes beyond the technological characteristics and features of the Internet, as SMEs construct a view of the Internet that is contextualised by their interpretations of the social worlds that they occupy (Lee, 1994). For example, a user's use of one medium rather than another for a particular communication transaction is subject to not only the influence of that user's own rationality, but also the influence of group norms, the influence of other individuals, and the influence of other extra-rational factors.

The more types of communication situations for which a medium is usable (the richer it is perceived to be in terms of speed, number of channels, type of language, and personalness), the more useful it may be seen and the more it may be used, regardless of efficiency considerations (Schmitz and Fulk, 1991). As Markus (1988) research has shown, individuals do not always make the most efficient and effective media choice using criteria of objective efficiency. Although the primary focus of the information richness model is on communication (email), many studies (Abell and Lim, 1996; Poon and Strom, 1997) have shown that e-mail remains the primary and most used application of the Internet. Email has important implications for organisational communication, it offers gains in both effectiveness and efficiency and it has the potential to change the nature and diversity of interpersonal interactions (Fulk, Power, and Schmitz, 1986) as well as the organisation itself (Rogers, 1986).

The Internet is viewed not only as a communication medium, but also as a useful business tool which businesses want to be associated with. The global reach and the

openness of the Internet add to the richness of the Internet, and accessibility of information useful in forming solutions to problems. The case result showed reachability of others through the Internet as a factor in adopting and using the Internet. The same medium with the same features could readily support rich communication among some users in some organisational contexts, but only lean communication among other users in other organisational contexts (Lee, 1994). For example, some managers may prefer a more 'hands on' approach and thus would opt to communicate using face-to-face interaction, whereas others may use Internet-based communication as a means of creating 'distance' between themselves and lower-level workers, in the hope of maintaining status differences (Howcroft, 1998). Thus, organisational members are more likely to use the email to send work-related messages if they perceive the medium as usable for the particular task at hand (Golden et al, 1992).

#### *7.2.1.4 Social influence model*

The technological factors were supported through facilitating factors such as compatibility of the technology with current values. The facilitating factors of social influence model is similar to Rogers (1983) innovation characteristics, Davis (1989) technology acceptance model, and media features of information richness theory articulated above. These theories generalised that medium features or technological characteristics influence adoption of the Internet in SMEs. While social influence model assumes that although relatively objective features of media do influence how SMEs perceive and use media, these features are but a part of an equation that determines media perceptions and use. The net effect is that media perceptions are not fixed and objective; instead they vary across SMEs and situations. Media properties such as richness are posited to be subjective, influenced to some degree by attitudes, statements, behaviours of others, and environmental context of SMEs setting.

The model predicts different patterns of Internet usage across SMEs due to differences in social norms and interaction patterns, even though tasks and media options are comparable. This prediction is evident in the case result; it showed some variations in the usage of the Internet. Some SMEs used it to conduct transactions while some used it for communication or searching for information. Consistent with this view, Ryu and Fulk (1991) found systematic variations in the perceptions of e-

mail's richness across the workgroups in an organisation. Schmitz and Fulk (1991) found that perceived electronic mail richness predicted individuals' electronic mail assessments and usage and perceived media richness varied with perceived social influences from co-workers and superiors. Schmitz and Fulk investigated the effects of perceived information richness and social influences amongst colleagues within a large research and development organisation. Their research explicitly modelled social influence factors and assessed their role in how individuals view and employ email. Their findings supported the view that social interaction in the workplace shapes the creation of shared meanings and that these shared definitions provide an important basis for shared patterns of media selection. Co-worker attitudes, in the form of perceived usefulness of email, affected email richness and also had an indirect effect on its use. Their study demonstrated that an explicit consideration of social influence aids understanding of how SMEs perceive and use information technology.

### ***7.2.2 Organisational factors***

The organisational factor is supported through the facilitating factors of social influence model. Organisational and environmental factors were not supported for diffusion theory, technology acceptance model and information richness theory. The reason is that diffusion theory was developed from a context outside organisation and did not consider organisational and environmental factors in the adoption of innovation. Technology acceptance model describes adoption behaviour from a set of two constructs of perceived usefulness and perceived ease of use. While information richness theory matches the characteristics of the communication media to the requirements of communication tasks in order to achieve organisational effectiveness. These theories generalised that medium features influence adoption of innovation, for example, they view richness as a relatively objective feature that is largely inherent in the medium. While social influence model argues that media do not have fixed properties, but rather different individuals have different perceptions of the media.

The facilitating factors of social influence model include organisational support for the medium and training support for new media, as well as specific hardware and software features. These factors are consistent with the case result, which showed management support, organisational resources, and organisational size as crucial factors that contribute to the adoption and use of the Internet in SMEs. Management



typically controls access to the infrastructure supporting adoption, such as allocating resources, offering educational programs, applying information technology to support a wider variety of business tasks, and may even control physical access to the hardware and/or software needed to use innovation (Leonard-Barton 1987; Leonard-Barton and Deschamps 1988). Management is not only expected to carry on the crusade for adoption within the organisation, they also need to the responsibility for overcoming the apprehension and resistance to the innovation, by organising needed resources and training (Ramamurthy and Premkumar, 1995) and convincing staff of the benefits that will accrue from using the Internet. The more support given by management, the more likely organisational resources would be allocated to the implementation of innovation decisions, which would in turn facilitate the adoption and success of an innovation.

### ***7.2.3 Environmental factors***

The competitive pressure and external pressure of environmental factors were supported. Environmental factors are those changes in the business environment that create threats as well as opportunities for an organisation and are usually beyond the control of the management of an individual SME. The result showed that these categories influenced the adoption and use of the Internet. Few of the SMEs started using the Internet because of the perception of increased competition within and from other industries. They interpreted these pressures as threats to their competitive position and their profitability ratio. MGL reported that "they started to use the Internet because they felt that more and more people are using the Internet so they decided it is time they do something about it". She added "to compete in today's competitive market, organisations have to follow the trend and join the Internet revolution". SAH reported that "they started to use the Internet just to keep in line with the way information technology is going, they do not want to be left behind". AL explained that one of the main reasons that encouraged them to use the Internet is because "almost every other company in the world is using it".

The case result showed that the adoption and use of the Internet was prompted by external pressure rather than by a serious business decision. BIL reported being pressured to adopt and use the Internet. "We started to use the Internet because we were asked to use it by our trading partner (Peugeot manufactures), and as a dealer

with them, we have no choice but to start using it or risk losing our dealership". The imposition from trading partners is one of the most critical factors for Internet adoption by SMEs; as the weaker partners in inter-organisational relationships, SMEs are extremely susceptible to impositions by their larger partners (Saunders and Hart, 1993; Iacovou, Benbasat, Dexter, 1995).

These findings are consistent with social influence model which posits that media properties are subjective, influenced to some degree by attitudes, statements, behaviours of others, and environmental context of SMEs setting. The case study result has shown that elements of SME's environment and the perceptions of that environment influence how SMEs adopt and use the Internet. Fulk, Steinfield, Schmitz, and Power (1987; Steinfield, 1986) propose a theory of social information processing as a predictor of user attitudes toward IT and motivation for use. The theory is based on social interactionist roots and addresses the impact of SMEs subjective view of the external environment on Internet adoption and use. Although their theory appears similar to Daft et al's (1987) symbolic interactionist perspective, Fulk et al (1987) view properties of the media as subjective, not objective, and believe SMEs' perceptions of the environment and media choice is seen as socially rather than rationally determined.

Whilst the social influence model is a notable advance from the more rationalistic views of diffusion theory, technology acceptance model and information richness theory. It feeds into the much broader question of the relationship between the social and the technical and the ways in which these two elements are viewed as disparate. Howcroft (1998) argues that it is perhaps more appropriate to view the Internet in terms of the rich interplay of both the social and technical factors as opposed to focusing primarily on one aspect, often to the detriment of the other.

#### ***7.2.4 Barriers to Internet adoption***

The direct constraints on media use of social influence model were supported in the case study. This includes barriers that prevent utilisation of the Internet in SMEs. Several factors that inhibit technology adoption were identified; among these were the cost of investment (Tornatzky and Klein, 1982; Ramamurthy and Premkumar, 1995), complexity of the technology (Rogers, 1983; Tornatzky and Klein, 1982), security of

information and lack of technological skills/knowledge (Pfeiffer, 1992; Saunders and Clark, 1992). These barriers play a big role in the context of SMEs, where resources and computer sophistication is limited (Blili and Raymond, 1993; Cameron and Clarke, 1996; MacGregor et al, 1998; DeLone 1988; Igarria et al, 1997).

The social influence model predicts that social norms may interfere with the acceptance of an otherwise rational and efficient new technology innovation. This prediction is consistent with the case result, which showed that a significant inhibitor of adoption of the Internet was SMEs perception of security of the Internet. For example, perceptions of information security for conducting transactions, an elaborate technical arrangement can be made to provide a secure transacting environment. However, if key individuals in the organisation-expressed concerns over information security, this fear may be diffused and inhibited the use of the Internet throughout the organisation. In this case, objective features of security have considerably less effect than the unfounded fears communicated in the social environment (SMEs).

The social influence model also predicts that richness perceptions of media vary in a non-random fashion and they are directly linked to social context and media experience factors. It is assumed that knowledge in using communication technologies facilitate use, whilst lack of media related experience inhibits use; the “rich” objective features may be perceived as irrelevant if the user does not have the experience/skill to access and use them. This is consistent with the case study findings that showed Internet knowledge and skill facilitate Internet use and it was crucial in influencing SMEs decision to adopt the Internet. SMEs with little or no knowledge of the Internet experienced difficulty in making judgements of its potential uses and are inhibited from fully exploiting the Internet potential. The findings are also consistent with the broader IT adoption and implementation literature (Boynton, Zmud, and Jacobs, 1994; Cragg and King 1993; DeLone, 1988) that have found lack of knowledge as an inhibitor to adoption and use of information technology.

### ***7.2.5 Limitations of theories***

The case results have provided some support for the theories in explaining the adoption of the Internet in SMEs context. However, diffusion of innovation theory, technology acceptance model and information richness theory are too narrow and

mechanistic to fully explain the adoption of the Internet in SMEs, these theories are characterised by largely positivist epistemology. These theories focussed on the media features and task characteristics to explain the adoption and use of the Internet in SMEs. They are based on the assumption that the Internet has an objective set of features, which can be replicated in any SME setting, regardless of the particular SME context.

The social influence model is an exception, as it incorporates social behaviour in technology adoption in organisations. The model places greater emphasis on contextuality and incorporates significant assumptions about social behaviour in technology adoption in organisation. The model assumes that although relatively objective features of the Internet do influence how SMEs perceive and use it, these features are but a part of an equation that determines media perceptions and use. The perceptions of objective features such as ability to provide a permanent record and asynchronicity (Culnan and Markus, 1987) may differ across SMEs. The media and task features are variably salient to SMEs and are also determined to a substantial degree by the attitudes, statements, and environmental context in which SMEs operate. For example, SME's use of the Internet rather than the telephone for a particular transaction is subject not only to the influence of that SME's rationality, but also the influence of group norms, the influence of others, and the influence of other extra-rational factors (Fulk et al, 1990).

While much of the diffusion theory is still applicable to adoption of innovations by organisations (Van de Ven 1991), modifications and extensions are needed because some variables do not map cleanly to the organisational level of analysis. For example, the organisational adoption of an innovation is not a binary event but rather one stage in a process that unfolds over time. Diffusion theory assumes that end-user adoption of IS innovation is based on an evaluation of the innovation characteristics, such as relative advantage (Rogers, 1983) or perceived usefulness (Davis, 1989) that do not require extensive specialised knowledge prior to adoption (Fichman, 1992). Adopters, rather than making a binary decision to adopt or reject, may choose differing levels of IT use (Bayer and Melone 1989).

The adoption of innovation in organisations may be encouraged by management (Leonard-Barton and Deschamps 1988) or even mandated (Moore and Benbasat 1991). The adoption decision of organisations may depend on the dynamics of community-wide levels of adoption. A technology can involve important user interdependence, the technology can be subject to network externalities (Markus, 1987), which means that the value of use to any single adopter is a function of the size of the network of other users. The critical mass theory of interactive media adoption (Markus, 1987) proposes that a critical mass of adopters must exist before interactive media can hope to "catch on". A corollary proposition asserts that interactive media have the potential for universal access (adoption and use by all members, much like current telephone use in organizations), and its use entails reciprocal interdependence (more than one person must participate in the technology due to its interactive nature). Examples of recent IT innovations strongly subject to network externalities include the Internet and its applications (email, voice messaging and computer conferencing) (Fichman, 1992). This theory modifies Rogers' in that it must allow for the system's inherent need for more than one user to adopt for interaction to occur.

The current TAM model, with its assumption of users being motivated primarily by job performance expectations from IS use, may be considered as a model of compliance (Malhotra, 1997). In this model, users are motivated to use the IS to gain specific rewards. The model in its present form is not capable of fully explaining IT usage behaviour of an organisation, especially when accounting for the changes in the task characteristics and its applicability in an ever rapidly changing organisational environment. The model two constructs are limited to technological attributes of usefulness of the computer technology and the ease of use of the technology. There are other factors to consider when organisations are adopting any technological innovation, such as the organisational characteristics (e.g. resources) and external influences such as external pressure from trading partners.

Information richness theory has been criticised for its over-reliance on rational processes to explain the entire range of media-choice situations. It has shown weak or mixed results in linking the richness of a chosen medium to the ambiguity or equivocality of the task (Schmitz and Fulk, 1991). Although information richness theory has evolved, "it remains an individual-level rational choice theory", in which

individuals' perceptions of the objective material characteristics of media are assumed to play a key causal role (Markus, 1994). Information richness theory has been challenged for failure to take into account situational factors that might influence behaviour (Markus 1987, 1994) and social factors that might shape perceptions of media adoption in organisation (Fulk et al. 1987).

### ***7.2.6 Extension of diffusion theory and technology acceptance model to SMEs context***

The extension of diffusion theory and technology acceptance model are considered necessary, in part, in response to the perceived limitations of the diffusion of innovation theory, which was developed, in a non-organizational setting (Bayer and Melone 1989). Diffusion theory assumes that end-user adoption of IS innovation is based on an evaluation of the innovation characteristics, such as relative advantage (Rogers, 1983) or perceived usefulness (Davis, 1989) that do not require extensive specialised knowledge prior to adoption (Fichman, 1992). While technology acceptance model assumes that users are motivated to use IS primarily by job performance expectations. The model two constructs are not capable of explaining IT usage behaviour of an organisation, especially when accounting for the rapidly changing organisational environment.

Attewell (1992) argues that the processes of information flow, communication and uncertainty reductions, which are central to diffusion theory, have only a limited role to play in organizational adoption. Instead other factors such as managerial actions, management support and environmental factors play a key role in the organisational adoption of innovation (Leonard-Barton and Deschamps, 1988). More recent research has focused on extending diffusion theory to more complicated adoption including adoption of innovations by individuals subject to strong managerial influences (Leonard-Barton and Deschamps, 1988) or by organizations as a whole (Kwon and Zmud, 1987; Robertson and Gatignon, 1986). Kwon and Zmud (1987) have recently developed more comprehensive frameworks for studying organisational adoption and diffusion. The Kwon and Zmud framework define five contextual factors (user community characteristics, organisational characteristics, technology characteristics, task characteristics, and environmental factors), each of which may impact any of six

stages of IT implementation (initiation, adoption, adaptation, acceptance, routinization, infusion).

In this study, research findings on the influence of organisational and environmental factors drawn from literature on IT usage, adoption of innovation and implementation, are integrated with the current diffusion of innovation and technology acceptance model. The need for such integration is primarily twofold. First, it has been recognised by diffusion researchers that the influence of organisational factors (Fichman, 1992) and environmental factors (Frambach, 1993) on organisational adoption has received little attention in previous research. This is surprising, because the importance of these factors has been acknowledged by several researchers in the field of diffusion and because such integration can be used to enhance the understanding of adoption of innovation in organisation. Second, the main points of criticism of these theories can be addressed by taking an integrative perspective, which considers the factors involved in the adoption of innovation to a broader extent.

Therefore, to fully explain the adoption of the Internet in SMEs, the study has extended the diffusion of innovation and technology acceptance model to SME context, by adding organisational and environmental factors. These seem natural additions because these factors emerged in the case study analysis and were found in the literature as important in organisational adoption of innovations. Organisational factors are those categories affecting the organisational structure that the organisation could adjust or change to suit its changing environment. Organisational factors include management support, organisational resources and organisational size. Although a number of authors (Kwon, 1990; Wolf, 1994; Rogers, 1983) have incorporated technological factors in the analytical models of diffusion, the net result is that studies of adoption within organisational settings must incorporate factors such as organisational factors (managerial influences) into the analysis.

The environmental factors include the degree of competition in the market (competitive environment) and the external pressure from trading partners. These factors cannot be controlled by decisions made by the management of the individual firm. The relevance of such factors has been pointed out by a number of researchers (Fichman, 1992; Frambach, 1993; Kwon and Zmud, 1987; Robertson and Gatignon,

1986). Environmental factors are found to be particularly important in explaining adoption in organisations. Robertson and Gatignon (1986) proposed an extended behavioural paradigm of technology diffusion among organisations in order to incorporate competitive effects on the diffusion process in the extant paradigm outlined by Rogers (1983). They found that a variety of competitive effects in the technology adopter's industry (competitive intensity, demand uncertainty) and within the technology supplier's industry (level of competitiveness, reputation, and technology standardisation) impact the rate of adoption and level of diffusion of high technology innovations. Based on the case study result and empirical findings reported in the literature, conclusions can be drawn as to the influence of environmental factors on the rate of adoption of innovations in organisation.

Barriers to Internet adoption are obstacles, which prevent or inhibit SMEs from adopting and using the Internet in business. Several factors that inhibit technology adoptions were identified, among these were the cost of investment and complexity of the technology, lack of technological skills/knowledge, security of information, limitation of infrastructure, limitation of personal contact with the customer, uncertainty about Internet value in business, lack of universal electronic payment systems and a lack of system integration (Pfeiffer, 1992; Saunders and Clark, 1992). These barriers play a big role in the context of SMEs, where resources and computer sophistication is limited (Blili and Raymond, 1993; Cameron and Clarke, 1996; MacGregor et al, 1998; DeLone 1988; Igarria et al, 1997). By integrating factors that emerged from the case analysis with findings from the literature into the adoption of Internet model, the understanding of adoption of the Internet in SMEs is enhanced. This strategy has the merit of contributing toward a cumulative tradition in IS research.

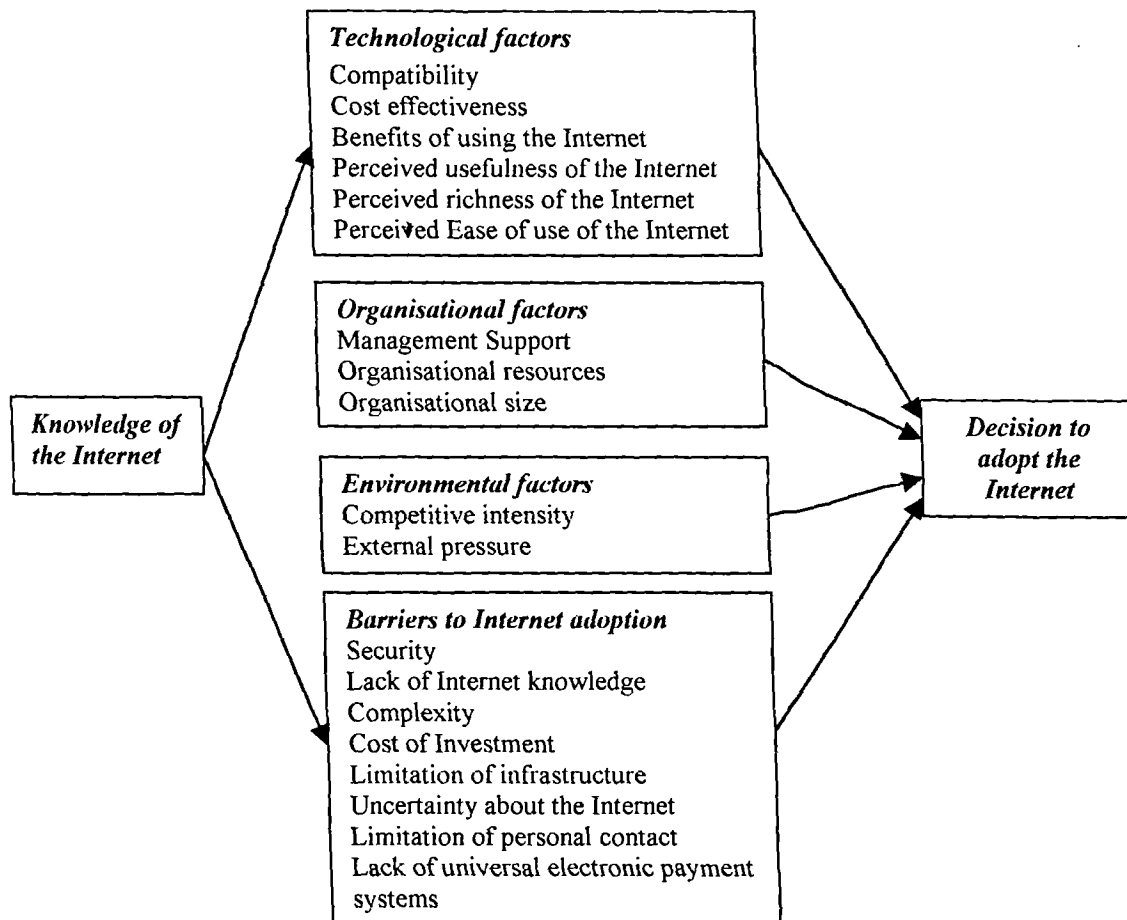
### ***7.2.7 Revised integrated model of SMEs' Internet adoption***

The model presented in figure 6.1 emerged from the analysis of the case study. The theoretical model simply represented what Miles and Huberman (1994) describe as "the current version of the map of territory being investigated". It is the researcher's first cut at making some explicit theoretical statements. Miles and Huberman state that the conceptual framework can change en route as data is collected and the framework becomes more precise, replacing feeble 'bins' with more meaningful ones and



reassessing the relationships. The factors and categories that emerged from the analysis of the case study have resulted in the revision of the theoretical model to reflect the findings in the literature. The theoretical model shown in figure 6.1 has transformed to the revised theoretical model of figure 7.1. The SMEs Internet adoption model presented here integrates research findings on factors influencing adoption from several sources thereby enhancing the understanding of adoption of innovation in SMEs. This approach contributes to solving several of the main points of criticism of the limitation of the theories discussed in section 7.2.5. The model has been utilised as a means of supporting the communication of the research findings.

Figure 7.1 Revised Integrated Model of SME Internet Adoption



The technological factors, organisational factors, environmental factors and the barriers to Internet adoption of the original version emerged in the revised model. These factors are found to be consistent with previous research on IS adoption and

small firms that have identified technological attributes (Rogers, 1983; Tornatzky and Klein, 1982; Leonard-Barton, 1987; Davis et al, 1989; DeLone, 1988; Thompsen et al, 1991; Yap et al, 1992; Frambach, 1993; Wolf, 1994), organisational characteristics (Kwon and Zmud, 1987; Kwon, 1990; Wolf, 1994; Igbaria et al, 1997) and environmental factors (Kwon and Zmud, 1987; Wolf, 1994) as influential in the adoption and use of IT in organisations. While barriers that inhibit technology adoptions have been identified, among these are the cost of investment, complexity of the technology, lack of technological skills/knowledge, lack of resources, security (Pfeiffer, 1992; Saunders and Clark, 1992; Clarke, 1991, 1992).

A new category has been added to the model called knowledge of the Internet. Although this category emerged in the case study analysis process, the findings from the literature show the importance of this category in influencing adoption and use of the Internet. The case findings clearly indicate that Internet knowledge is crucial for bringing about high levels of IT use within organizations. This finding is consistent with literature. The important determinant of adopter innovativeness for organisations is the level of skills and knowledge gained over the course of the adopter's cumulative history of innovation activities. It may be the case, especially for small companies, that lack the know-how to process potentially valuable information adequately (Frambach, 1993). Cohen and Levinthal (1990) develop the idea that an organisation's innovative capability is determined by its absorptive capacity, where absorptive capacity is defined as the organisation's ability to recognise the value of new information, assimilate it, and apply it to productive ends. Cohen and Levinthal argue that absorptive capacity is developed over time through prior investments in learning areas that are closely related to the innovation at hand.

Other research on the use of IT in organisational settings points to knowledge structure as a key construct in organisation ability to adopt and use new technologies in their operational and strategic fabrics. Boynton, Zmud, and Jacobs (1994) found that IT knowledge is crucial for influencing organisations decision to adopt and use IT in business. Leonard-Barton (1987) found that experienced analysts were more likely to adopt because they were more capable of grasping the benefits of a tool to create more maintainable codes; or in other words, their absorptive capacity with respect to this innovation was higher. Schmitz (1988) provides confirmation of positive

relationships between electronic mail use and medium expertise, although Schmitz found that electronic mail use varied inversely with computing experience, usage was positively related to electronic mail experience and skills (Schmitz, 1988; Fulk, Schmitz, and Steinfield, 1988).

Lack of Internet knowledge reduces the potential for successful adoption and use. This is consistent with the previous IT adoption and implementation literature which has identified lack of technological skills/knowledge as factors that inhibit technology adoption (Pfeiffer, 1992; Saunders and Clark, 1992). Schmitz and Fulk (1991) argue that “individuals with little experience or skills will have difficulty making judgements of medium richness and may be inhibited from using the medium even in a supportive social environment. Indeed, empirical findings suggest that lack of technical knowledge is one of the most important factors that hinder IT growth in small organisations (Cragg and King, 1993; DeLone 1988). Figure 7.2 shows the knowledge of the Internet influences adoption of the Internet indirectly through its effect on technological factors and barriers to Internet adoption.

### **7.3 Conclusion about the research problem**

The previous section discussed the revised integrated model of SMEs Internet adoption. This section presents the conclusions of the research problem.

#### **7.3.1 Survey questionnaire**

It is difficult to draw quantitative conclusions about SMEs and the use of the Internet, partly because this is still very much an emerging technology and many of the SMEs in the study have only started using the Internet in the last 18 months. Most of the SMEs examined in the survey were already comfortable with computer technology before they started to use the Internet. The Internet was primarily used for information gathering, customer service, communication, advertising and marketing products to wider audience. The main Internet resources used by SMEs were email (96%), web (92%) and searching for information (78%). The Internet was seen as an important business tool, essential for carrying out tasks in the workplace, and particularly it was used as a means of communication and information retrieval.

Most SMEs cited communication and expanding geographical coverage as important factors in the decision to use the Internet. The use of the Internet for communication was especially useful in that it provided an efficient, informal and inexpensive method of communicating with customers and business associates. The asynchronous nature of the Internet and the documentary record of action of email provided notable benefits when communicating with customers in different time zones. It was seen as a less formal and a more interactive and dynamic mode of communication. Customers were more inclined to reply electronically, because the process of communication was easier. The survey findings support what other empirical studies have suggested that the Internet is a useful medium for communicating and searching for information (Poon and Strom, 1997; Abell and Lim, 1996). However, its use did not totally eliminate other means of communication (such as telephone or fax). The use of the Internet for communication (email) was regarded as an additional means of communication, rather than a substitute.

The Internet was seen as a necessity in today's business, a tool to improve the way business is conducted and as a gateway to the global market. The majority of SMEs believed that Internet capability provides a level playing field on which small firms can compete with larger firms. The Internet was an extremely attractive method for SMEs to extend their geographic reach at minimal cost and reach global customers that was not possible before. It was viewed as a cost-effective means of providing information, advertising products and conducting transactions. It was seen as an important medium for SMEs to establish and tighten relationships with their suppliers and customers.

The survey result showed that SMEs used their web site and email to provide customer support. It was regarded as a cheap and efficient way to provide customers with information and support. SMEs with web sites were more active users of the Internet than those without web sites. SMEs with web sites used it to advertise or provide information to their customers, while SMEs without web-sites were in the earlier phase of Internet usage and used the Internet to obtain information rather than provide information or conduct transactions. The web was viewed as a positive development that enhanced the usability of the Internet. The survey results showed that SMEs that used the Internet in business perceived it as a relatively low-risk, high-

reward strategy. The survey concluded that most SMEs that adopted the Internet do so because of the benefits it offered to their organisations. The survey has shown that Internet usage in SMEs was widespread and not confined to particular sectors of industry or business activity.

The survey found that smaller businesses were half as likely to adopt and use the Internet as medium businesses, with those not connected largely feeling that they had no real use for it. Whilst (44%) of SMEs not connected felt that the Internet was simply not relevant to their work or could not assist their business. This was mainly due to a focus on cost reduction and improving productivity that can be done through more traditional IT. The survey result revealed that medium-sized companies were the most enthusiastic about the use of the Internet and the small companies the most uncertain. This was partly a reflection of the fact that medium-sized companies were more likely to have the financial capability to invest in IT whilst small companies were more wary of committing their funds. The survey result lends support to the case study findings that showed size of an organisation-influenced adoption and use of the Internet. Medium-sized companies had higher levels for almost all the activities listed and they showed a higher level of interest in improving the firm's overall image through the use of the web site, while smaller firms emphasised the importance of increasing sales to a greater degree.

The survey found that the use of the Internet had not managed to fulfil SMEs business objectives of increased sales and profits satisfactorily. The result showed that the claims and the media hype made for business use of the Internet against the reality of Internet usage in organisational settings was not always right, sales increase and profitability were far lower than expected. The survey's findings lend support to the earlier studies which revealed that many SMEs participating in Internet commerce activities do so in the hope of achieving marketing benefits, better global exposure and customer relationships (Abell and Lim, 1996; Poon et al, 1996; Hamill and Gregory, 1997). While the Internet is more efficient in communicating and accessing global information, it is not yet efficient enough to conduct full commerce due to the limitation of Internet infrastructure and the fear of security of information. The use of the Internet simply enabled SMEs to work more efficiently and to extend or support the use of existing computer-based tools. The use of the Internet to conduct business

was regarded as an evolution of commerce or improved way of buying and selling. The overall attitude of the SMEs toward the use of the Internet in business was positive.

### 7.3.2 *Case study*

The case study findings have provided new insights into the factors that influence SMEs decision to adopt and use the Internet in business. The case data showed that many of the factors that influenced adoption of the Internet in SMEs were similar to the factors identified in large organisations (Igarria et al, 1997; Davis, 1989; Kwon and Zmud, 1987). However, technological, organisational and environmental factors emerged from the case analysis and were suggested by the literature as significant in influencing SMEs decision to adopt and use the Internet. While barriers hindered adoption of the Internet. This result highlighted the fact that SMEs have special needs due to their unique organisational characteristics.

The categories constituting these factors were combined to formulate a framework to serve as a summary for SMEs Internet adoption (see Table 7.1). The presence of these categories is indicated by a 'Yes' in the table. The results indicated a positive relationship between technological, organisational factors and the decision to adopt the Internet and less for environmental and barriers to Internet adoption. In all the cases, technological and organisational factors (management support and organisational resources) were congruent with the adoption decision, except for one SME that did not indicate a yes for organisational resources.

The results confirmed that organisational factors (management support and organisational resources) played a critical role in the adoption decision of the Internet. Adoption and use of the Internet tended to take place in the firms where the management was enthusiastic about Internet technology and had the necessary organisational resources. The case result showed that SMEs were generally very enthusiastic in their involvement with the adoption and use of the Internet in business. They viewed the advent of the Internet as a useful business tool that provided global connectivity; access to low-cost information and its use enabled them to be involved in electronic commerce. The low financial commitment required implied a high level

of perceived trialability among SMEs; an important consideration since smaller firms tended to have more limited financial resources.

Table 7.1 shows a less positive relationship between environmental factor, barriers to Internet adoption and the decision to adopt the Internet. In all the cases, only four cases indicated yes for competitive pressure and three indicated yes for external pressure, especially from trading partners. The barriers to adoption showed various categories that inhibited the adoption of the Internet in SMEs. The strongest barriers to Internet adoption were security and lack of Internet knowledge with three yes each, and two yes for cost of investment, limitation of infrastructure, uncertainty about the Internet and limitation of personal contact. While complexity and lack of universal electronic payment systems have only one yes each.

Finally, using a survey questionnaire and a multi-case study approach, the study has highlighted the issues of Internet uptake among the examined SMEs. This study has built on existing research on innovation adoption by showing the areas SMEs currently use the Internet most and the factors that influence their decision to adopt the Internet. The results showed that technological, organisational and environmental factors were very important factors that influenced SMEs decision to adopt and use the Internet while barriers to Internet adoption hindered adoption. The findings suggest that the adoption of Internet technology was influenced to a greater extent by the technological and organisational factors than by environmental factors.

Table 7.1 framework of SME Internet adoption

Core categories	Subcategories	Small to medium-sized enterprises						
		AL	SAH	BIL	BPC	FP	MGL	CLR
Technological	Compatibility	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Cost effectiveness	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Benefits of using the Internet	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Perceived usefulness of the Internet	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Perceived richness of the Internet	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Perceived ease of use of the Internet	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Organisational	Management support	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Organisational resources	Yes	Yes	Yes	Yes	Yes		Yes
	Organisational size						Yes	
Environmental	Competitive pressure	Yes			Yes	Yes	Yes	Yes
	External pressure			Yes	Yes		Yes	
Barriers to Internet adoption	Security	Yes	Yes				Yes	
	Lack of Internet knowledge		Yes	Yes			Yes	
	Cost of investment		Yes				Yes	
	Complexity			Yes				
	Limitation of infrastructure					Yes		Yes
	Uncertainty about the Internet			Yes	Yes			
	Limitation of personal contact			Yes				Yes
	Lack of universal electronic payment systems							Yes

Source: (Case study data)

#### 7.4 Evaluating interpretive research

The previous section presented the conclusions of the research problem. In this section an evaluation of the interpretive research is presented. The conventions for evaluating information systems case studies conducted according to the natural science model of social science are now widely accepted. Benbasat et al (1987), Lee (1989) and Yin (1994) formulated a set of methodological principles for case studies that were consistent with the conventions of positivism. As a result, case study research is now accepted as a valid research strategy within the IS research community. The principles proposed in their work have become the de-facto standard against which most case study research in information systems is evaluated. However, while their criteria are useful in evaluating case study research conducted according to the natural science model of social science, the positivist criteria they suggest are inappropriate for interpretive research.

The use of the interpretive approach is relatively new to information systems field, the approach has emerged as a valid and important strand in information systems research and most mainstream IS journals now welcome interpretive research and significant groups of authors are working within the interpretive tradition (Walsham, 1995). One



of the main aims of interpretive research is seeking meaning in context. The use of interpretive perspective can help researchers to understand human thought and action in social and organisational contexts. It has the potential to produce deep insights into information systems phenomena including the use and the management of information systems. The interpretive research does not subscribe to the idea that a pre-determined set of criteria can be applied in a mechanistic way, it does not follow that there are no standards at all by which interpretive research can be judged.

Striving and ensuring rigor in interpretive study requires different criteria through which one view and judges the quality and completeness of the research process. Many researchers (Orlikowski et al, 1991; Walsham, 1993, 1995; Klein and Myers, 1999) have addressed qualitative research and they have shown how the nature and purpose of interpretive research differs from positivist research. At present, there are no agreed criteria for evaluating research of this kind. Nonetheless, there must be some criteria by which the quality of interpretive research can be evaluated. Myers (1997) and Klein and Myers (1999) have proposed a set of criteria for the conduct and evaluation of interpretive research in information systems. This study is not concerned with adhering to the scientific tenets of precision and replication, instead the study is concerned in seeking a theory that is compatible with evidence that is both rigorous and relevant and generally useful to other areas. The criteria proposed by Myers (1997) for evaluating interpretive research will be discussed in relation to this particular study. Myers suggests that interpretive research can be evaluated in terms of theory and in terms of data.

#### *Interpretive research in terms of theory*

*With regard to theory, Myers suggested that interpretive research could be evaluated in terms of its contribution to the field and whether the author has developed or applied new concepts or theories?* The theoretical focus of this study is the factors influencing adoption and use of the Internet in SMEs. The result of the case study analysis was used to develop a theoretical model that explains the factors that influence SMEs decision to adopt and use the Internet. The results of the case study were discussed in terms of the categories that emerged from the grounded theory analysis process and integrated insights from the existing body of literature. The theoretical model was then revisited and reconsidered in light of the literature review

and the empirical findings. Existing literature has also been integrated into the reporting and discussion of this research study.

*Another key issue considered by Myers is whether the author offers rich insights into the human, social and organisational aspects of information systems development and application.* The analysis of the data from the field study provided rich insight into how SMEs currently use the Internet to carry out tasks and it offers a far richer understanding of the factors that influence their decision to adopt the Internet. The rich varieties of SMEs' viewpoints were captured through the use of different data collection techniques. Each of these techniques offered a different avenue for the SMEs to express their perception of Internet usage in business and the materials provided consistency in the same procedures being used for each case (Yin, 1994). The use of multiple techniques to elicit SMEs' viewpoints acted as a means of testing one source of information against other sources and this helped in improving the quality of data and provided a richer, contextual basis for interpreting and validating results (Kaplan and Duchon, 1988).

*The final key issue Myers considered is whether or not the study contradicts conventional wisdom and thus provides richer understanding.* The study developed a theoretical model that provided a far richer understanding of the factors that influence SMEs decision to adopt and use the Internet in business. The categories of technological, organisational and environmental factors were shown to be relevant in influencing adoption and use of the Internet while barriers to Internet adoption hinder adoption of the Internet. The theoretical model proposed here is different from the existing frameworks of Rogers (1983) diffusion of innovation theory and the technology acceptance model of Davis (1989), because the proposed model added new constructs to these theories.

The technology acceptance model with its two constructs of perceived usefulness and perceived ease of use and the diffusion theory with its innovation attributes are limited in explaining the adoption and use of the Internet in SMEs. These models considered only the technological aspect of adoption of innovation; they are based on the deterministic assumptions of technological imperative, and hence discount the importance of human intentions and action in shaping the adoption and use of

technology. They are variance models, and hence do not adequately capture the contextual issues that are fundamental to examining adoption of IT in organisation.

The theoretical model developed in this study redressed the limitations of these models by accounting for organisational and environmental factors relevant to adoption and usage of IS in organisation. The case result has shown that other factors such as organisational characteristics (e.g. resources) and environmental characteristics (external pressure) are necessary in explaining the adoption and use of the Internet in SMEs. The study extended the diffusion of innovation theory and the technology acceptance model by adding these new constructs of organisational and environmental factors to better explain the adoption and use of the Internet in SMEs.

#### *Interpretive research in terms of data*

*With regard to data, Myers suggests a significant mass of data must have been collected for significant insights to emerge.* The combination of different data techniques provided a significant quantity of data that enabled significant insights to emerge. It provided a sufficient range of examples of how and why SMEs adopted and used the Internet in business. The study provided sufficient citations and quotes in each of the cases used and this provided an important way of ensuring internal validity in the study. The diversity of SMEs backgrounds in this study provided a considerably broader context and process of Internet usage in business. It also provided rich insights into the human, social and organisational aspects of information systems adoption and use.

*Myers suggests that a good piece of interpretive research should represent multiple viewpoints and alternative perspectives.* Multiple viewpoints and alternative perspectives occurred in this study through the inclusion of adopters of the Internet and non-adopters. When the participants were selected, it was decided that both SMEs that use the Internet and those that do not use the Internet in business be selected for this study. The inclusion of SMEs with different level of Internet use and those that do not use the Internet in business enabled the researcher to gather different viewpoints from the participating SMEs and it provided different viewpoints on the factors that influence adoption. Therefore, given the diversity of backgrounds of the SMEs

selected for this study, both the context and the process of Internet usage differs considerably, thus providing a broad social context.

*Another issue Myers considered is whether sufficient information about the research method and the research process has been presented.* The application of the specific research methods chosen for this study, which was based on interpretive paradigm and used quantitative survey and qualitative case study, was discussed and the justification for choosing the mixed methodology approach was given. The interpretive approach shows that the whole arena of social relations revolves around shared meanings, interpretations, and the production and reproduction of cultural and social reality by humans. It motivates investigations into how humans enact a shared social reality through understanding human behaviour from their point of view of the world. Considerable attention was devoted to the research process, in terms of both the philosophical underpinnings of the research method as well as the practicalities of conducting the study. Details of this have been provided in chapter 4, which outlined how the data was gathered, when and where the research took place, how the research developed over time, and how the data was analysed.

Myers concludes that the most important question relating to the quality of the contribution concerns the significance of the findings for both researchers and practitioners. This research has several important strengths in addition to having been designed explicitly to develop a theory of adoption and use of the Internet in SMEs. The study adopted a strategy of methodological triangulation that yielded both qualitative and quantitative evidence intended to facilitate the interpretation of results.

### **7.5 Contribution of the research**

The previous section evaluated the interpretive research; this section discusses the research contribution. The contribution of this study can be judged from a number of perspectives. The research has presented a broader picture of how SMEs currently use the Internet to carry out tasks, and the factors that influence their decision to adopt it in business.

A number of recent developments indicate that the factors influencing the decision to adopt IT is one of the most important issues facing many organisations, particularly

SMEs. The UK Labour government recently published a white paper on the uptake of the Internet in SMEs in response to growing global competition of information technology, particularly the Internet. The white paper (entitled 'Information Highway') relates specifically to the role and importance of SMEs to the economy. It reinforces the importance of SMEs participation in global trade and for researchers of examining the role of the Internet in SMEs business. This present research is therefore both relevant and timely. The findings make a significant contribution to the understanding of the factors that influence SMEs decision to adopt and use the Internet in business.

The limited research conducted in the UK into adoption of the Internet in SMEs has tended to focus on Internet usage. The factors influencing the decision to adopt the Internet in SMEs has not attracted the attention of the research community. This trend is consistent with the research focus in other countries. Within the context of the UK this study breaks new ground because it focuses exclusively on SMEs decision to adopt and use the Internet.

The factors influencing large organisations decision to adopt and use the Internet are significantly different to the factors influencing SMEs. Findings from the relatively substantial amount of research conducted into adoption of IT in large organisations may not be relevant for an understanding of SMEs decision to adopt similar technologies which have a range of different functional characteristics. The findings from this study go some way towards addressing this imbalance in the research focus.

The study is useful for researchers interested in understanding factors that influence the adoption of information systems in organisations; or it may be used in studies within and across organisations by researchers who are interested in understanding the diffusion of information technology and the determinants of technology adoption.

The findings from this study can also act as a guide to help decision-makers take advantage of the Internet for business and it can help practitioners and researchers understand its growth in the marketplace. The study provides researchers and business planners with information on the growth and development of the Internet in the UK, and allows them to compare and contrast developments in the UK with the growth of the Internet in North America and other European countries.

Another significance aspect of this study is the development of an Internet adoption model based on theory-driven case study that explains the factors that influence or inhibit SMEs decision to adopt and use the Internet in business. The model shows technological, organisational and environmental factors as important constructs that explains IT adoption and usage in organisation.

Drawing on the rich data of SMEs' experiences, the study generated a grounded understanding of the factors that influence the adoption and use of the Internet in SMEs. This grounded theory is valid empirically "because the theory-building process is so intimately tied with evidence that the resultant theory is consistent with empirical data". While many believe that building theory from a limited number of cases is susceptible to researchers' preconceptions, the author argues persuasively that the opposite is true. The iterative comparison across cases, methods, evidence, and literature that characterises such research leads to a "constant comparison of conflicting realities that tends to "unfreeze" thinking. The process has the potential to generate theory with less researcher bias than theory built from incremental studies or armchair, axiomatic deduction" (Orlikowski, 1993).

The grounded theory developed in this study added substantive content to the understanding of the factors that influence SMEs decision to adopt and use the Internet, such an understanding has been absent from the research and practice discourses on the use of the Internet in SMEs. The approach followed here focused specifically on developing such an understanding, thus bringing a fresh set of issues to the already-researched topic of the Internet. The study integrates grounded theory with the more formal insights available from the innovation literature, developing a more revised general theoretical model that allows researchers and practitioners to explain the adoption and use of the Internet in organisations.

The aim of using grounded theory method in this study is to build theory about the adoption of the Internet in SMEs, where no theory currently exists. To date there is very little knowledge and no explanatory theory about the factors that influence SMEs decision to adopt the Internet in business. Efforts were made to ensure that the study did not duplicate work already done. An extensive search of the research literature in the areas of IT usage, adoption and implementation was unable to locate any study

that utilises grounded theory methodology to develop a theory about the adoption of the Internet in SMEs. This study is therefore uniquely placed because it generated theory grounded in data collected from SMEs, about this particular phenomenon. The theory that is generated from this study is an original contribution to the knowledge base of the emerging field of IS.

The theory that emerged from this study was comprehensible and made sense to those SMEs studied. Also, the nature of grounded theory is such that the emergent theory 'was abstract enough and included sufficient variation to make it applicable to a variety of contexts related to this phenomenon' (Strauss and Corbin, 1990). In other words, the theory developed from this research is of use to other SMEs involved with the decision to adopt the Internet, as well as other groups such as policy makers, and members of the wider IS research community.

Grounded theory has been used extensively as a research methodology in sociology, and in nursing and related fields. It has been used less widely in IS. This study provides an opportunity for observations to be made about the applicability of this mode of research in the field of IS, and more specifically in innovation adoption. It is, therefore, hoped that the work presented in this thesis has contributed to a realistic understanding of Internet adoption and usage in organisations in general and SMEs in particular.

## **7.6 Implications of research findings**

The study has shown the areas SMEs used the Internet most and how they currently used it to carry out tasks in their business. It has presented the findings of a grounded theory study into the adoption and use of the Internet. It has provided a deeper understanding of the main factors responsible for SME decision to adopt and use the Internet in business. It has developed an enriched theoretical model for conceptualising the adoption and use of the Internet in SMEs. The study results indicated that technological, organisational and environmental factors influenced adoption and use of the Internet, while barriers to Internet adoption hindered adoption. The findings and framework articulated here have important implications for both researchers and practitioners.

### **7.6.1 Implications for research**

From an academic researcher's perspective, the findings suggest that innovation adoption theories should not only account for technological factors (innovation characteristics), but also organisational and environmental factors should be included in IT adoption and use in organisation. Although the adoption of the Internet in SMEs has been led by Internet attributes, however, the case result has shown the importance of organisational and environmental factors in SMEs decision to adopt and use the Internet in business.

The existing theories such as technology acceptance model and diffusion of innovation theory were developed with the concept of static individual computing environment in mind. As such, in today's rapidly changing IT environment, they do not provide adequate explanations of an organisation's IT usage behaviour (Kang, 1998). Further, there has been little or no previous study done to examine the applicability of these models to the SME context.

The technology acceptance model posits that both perceived ease of use and perceived usefulness correlate with system use. The model's two constructs are limited to technological attributes of usefulness of computer technology and the ease of use of the technology. The model, with its assumption of users being motivated primarily by job performance expectations from IS use, may be considered as a model of compliance. In this model, the users are motivated to use the IS to gain specific rewards. However, the model is influential in the contribution to the enduring line of IT adoption and diffusion research. It has proved useful for understanding the factors involved in organizational adoption decision making.

The same criticism goes to diffusion theory that considers innovation characteristics for adoption of innovation. However, diffusion theory provided a useful perspective on the adoption of innovations and diffusion in organisation. Fichman (1992) argues that conclusive results were most likely when the adoption context closely matched the contexts in which diffusion theory was developed for example, individual adoption of personal-use technologies or when researchers extended diffusion theory to account for new factors specific to the IT adoption context under study (Fichman, 1992). There are other factors to consider when organisations are adopting any



technological innovation, such as the organisational characteristics (e.g. resources) and environmental factors (external pressure); these factors emerged as important in the adoption of the Internet in SMEs.

An alternative model that extended the technology acceptance model and diffusion of innovation has been proposed in chapter 6 based on the findings from a theory-driven case study. The proposed theoretical model redressed the inadequacies of these models by developing a more enriched adoption model that considered not only the technological characteristics, but also the organisational as well as the environmental factors. The diffusion of innovation of Rogers (1983) and technology acceptance model of Davis (1989) have been expanded by incorporating both technological, organisational and environmental factors. Within the proposed model, each of these factors was shown as having an influence on the decision to adopt and use the Internet in SMEs. The models were extended to an SME context, whereas most previous research has used these models in large firms or on college students (Igbaria et al, 1997; Davis, 1989).

Empirical validation and elaboration of these concepts in other settings are clearly needed. The theoretical model was generated by only examining few cases, albeit in depth. More empirical grounding and comparisons will sharpen and enrich the concepts developed here and yield more complex understanding of the phenomenon. It is also necessary to investigate different contexts where the Internet has been introduced. While the SMEs studied here differed significantly on environment, strategy, size and structure, they still only represent few organisational types.

More organisations need to be examined to ascertain whether the proposed concepts and model are relevant in other situations. In this way, the analytic generalisation posited here, that other organisations' experiences with the Internet would resemble the patterns detailed above will be tested and elaborated. While more empirical work is necessary to elaborate and verify the theoretical model, it is believed that a useful starting point has been made. Understanding the factors that influence adoption of the Internet allows researchers to explain why SMEs introduce Internet technology in their business.

### 7.6.2 *Implications for practice*

There are many characteristics of the Internet that are useful to SMEs in particular and organizations in general. The Internet is non-proprietary and offers gains in both effectiveness and efficiency and it has the potential to change the nature and diversity of interpersonal interactions and how business is conducted (Fulk, Power and Schmitz, 1986) as well as the organisation itself (Rogers, 1986).

A growing issue in organizations is the overuse of paper for hard copies. Paper copies must be stored physically, which incurs great cost, and environmental concerns are beginning to weigh heavily on organizations, leading to pressure to reduce paper consumption when possible. Although FAX transmissions are fast, they still consume paper, and costs rise quickly if the transmission is a long one over great distances.

The Internet is fast and through its asynchrony, eliminates the need for communication to take place at the same time. The asynchrony of the Internet helps to reduce "telephone tag". It also lessens the impact of geographical distance between customers, suppliers and business partners and through its email function provides directness between sender and receiver. Due to automatic time and date stamping, email messages, if saved, can serve as useful audit trails and organizational histories.

The study has also identified key factors that influence adoption and use of the Internet in SMEs. The results pointed out that compatibility of the Internet and their relative advantages (in terms of operational and strategic benefits potential) are important facilitators of adopting the Internet in business. This suggests that SMEs contemplating using the Internet should explore and set up appropriate mechanisms to become more clearly aware of the technology. Industry-based associations and trade publications may be a few mechanisms to generate in-depth awareness of the Internet. Interaction with peer firms in the industry and their experiences may motivate SMEs to adopt and use the Internet. Such efforts would also help them to engage in initial experimentation that can significantly aid their own learning process and better understand the degree to which the Internet would be compatible with existing environments and work practices. The results also pointed out that management support and commitment is a crucial element in adopting and using the Internet in SMEs.

The study findings indicated that efforts should focus initially on greater management support. Education and training programs should aim to increase awareness of the Internet and emphasise the benefits of using it in the organisation.

The theoretical model developed and presented here suggests that before the implementation of a technology such as the Internet, managers in the organisation should articulate their intentions with respect to the technology and assess its usefulness and the resultant organisational consequences of the technology. A better understanding of these factors may enable practitioners to formulate strategies for improving the adoption and usage of the Internet in organisations.

The theoretical model developed here meets the criteria of practical applicability proposed by Glaser and Strauss (1967). It fits the substantive area of study. The concepts and relations posited as central are intimately related to the arena of the Internet adoption and use. The theoretical model is sufficiently general to be applicable to a range of situations around the adoption and use of the Internet in particular and IT in general.

It is readily understandable by practitioners, and should consequently provide some useful guidance in the organisations introducing the Internet. By providing practitioners with some insight into the context and the factors that influence the decision to adopt and use the Internet, the theoretical model serves as a basis from which the IS practitioner can assess and manage what is typically a poorly understood, complex, and dynamic situation (Orlikowski, 1993).

The theoretical model generated from the empirical findings has shown that the technological, organizational and environmental factors as well as the context, in which the Internet is used, played an important role in shaping the adoption of the Internet in SMEs. It has provided valuable insights for practitioners, detailing the factors that influence the decision to adopt and use the Internet in a business environment. The study has suggested that practitioners will be better able to adopt the Internet in business, if they understand how these factors influence its adoption and usage.

While all research methodologies have strengths and weaknesses, the use of the grounded theory approach here was particularly appropriate, generating a set of insights, concepts, and interactions that address the main factors involved in adopting and using the Internet in business, elements to date largely overlooked in the adoption literature (Orlikowski, 1993).

The study has made it clear that the success of adoption of an innovation in organization is dependent on a large number of factors. Managers should be aware of their potential impact on the adoption and diffusion of an innovation and of their interdependency. Applying the integrated model of Internet adoption in organizations, as presented here, can enhance such an understanding.

### **7.7 Limitations of the study**

Although the Internet comprises various functionalities, such as file transfer protocol, email and the web, the study views the Internet as a single product. This view is perhaps analogous to research on adoption of personal computer (PCs), which often focuses on general usage and adoption of PCs rather than on specific types of applications. Since results may vary in the case of different functionalities of the Internet, future research can perhaps examine the adoption and use of specific functions in greater detail. This study is cross-sectional in nature, which limits the ability to examine the processes involved in Internet adoption. A longitudinal study tracing the factors during the various processes of adoption can address this limitation. Alternatively, instead of focusing on organisations, it may also be useful to examine the adoption of the Internet by individuals. Comparison can then be made between individuals and organisations in terms of factors influencing the adoption of the Internet, for example, characteristics such as purpose of use and usage behaviours or patterns.

### **7.8 Further research**

The research has drawn conclusions about the adoption and use of the Internet in SMEs and has laid a foundation on which further longitudinal studies could be undertaken. It has identified technological, organisational and environmental factors and barriers that facilitate or hinder adoption of Internet technology. The focus of the present study is on the adoption and use of the Internet in SMEs. Additional research

could be conducted to determine if other kinds of technological innovations are affected by these factors.

The study has developed a theoretical model of Internet adoption and use in SMEs. Two of the main strengths of this model are its parsimony and the derivation of its factors from the empirical case study. Although the case-based investigation of the theoretical model has provided insights into the factors influencing adoption and use of the Internet in SMEs, further empirical study is needed to assess the validity of the theoretical model proposed in this study in order to develop an appreciation of the relative contributions of the model's constructs.

Because this is one of the earliest attempts to build a theoretical approach to modelling SME adoption and use of the Internet, the researcher believes that the theoretical model and propositions can form the basis of larger scale studies to examine the validity and applicability of the model and improve and refine it. As with any other simple model, there is a danger that additional significant factors have not been included in the model. Researchers who believe that additional variables play a critical role in the adoption of the Internet could use the constructs developed in this study in their own studies to better estimate the influence of each factor.

A cross-sectional study such as this is useful in identifying the patterns of relationships among the relevant factors, but large-scale longitudinal research design is essential in tracing the factors during the various process of adoption. Longitudinal investigations would allow researchers to measure the explanatory factors that emerged from the case study before the adoption of the Internet and more objectively assess the impact of the Internet on the organisations.

Future research is advised to carefully consider factors that emerged from the case study. These factors may not have been important in contexts in which the diffusion theory originated but appear to have important effects on innovation adoption in the SMEs examined in this study. Future research could also examine the role of technology "scope" in mediating the relative importance of organizational and individual factors. A different mix of individual and organizational factors can influence the adoption of information technologies such as the Internet.

research is needed to develop effective cost-benefit techniques to apply to the adoption and use of the Internet in business. For example, a checklist of criteria for SMEs would help SMEs evaluate if their needs warrant the adoption and use of the Internet. Such techniques are essential for companies making decisions about Internet adoption and trying to monitor its effectiveness. Further research should also examine the impact of Internet adoption on the performance of SMEs. Finally, the researcher suggests that the model be applied in the context of larger organisations as well. Such empirical testing will allow the identification of the necessary modifications to the model to enlarge its generalisability and isolate the differences in the factors that influence the adoption decisions of both SMEs and large organisations.

### **Reflection on the experience of conducting this research**

In this section the author reflects and considers what has been learnt about the methodology of the study and the research process.

One of the main problems of conducting this research was to decide an appropriate starting point for the research, and the basic framework within which the data will be collected and analysed. When conducting qualitative study for the first time, one is confronted with both the number of methods and the difficulty of analysing and presenting large amounts of data. Qualitative studies tend to produce large amounts of data that are not readily amenable to mechanical manipulation, analysis, and data reduction (Yin, 1984).

The process of analysing case data using grounded theory method was extremely time-consuming. The sheer volume and complexity of data generated for this study was quite daunting. The amount of time taken to transcribe and subsequently code and compare the transcripts was overwhelming. On average a 30 minutes interview took up to two and half-hours to transcribe. However, transcribing the full interview brought some fruitful lessons to the fore. Many of the codes that emerged from the case interview were in vivo codes, i.e. they were the words used by the participants. Most of these codes later became major categories. However, it was also the case that many of the codes were later discarded. Glaser and Strauss (1967) consider the emergence of 'theory' as inductive process, and therefore in the initial coding nothing should be omitted.

Grounded theory method involves long periods of uncertainty, without a priori hypotheses to test and established protocol to follow. The method requires certain qualities of the researcher. In particular, confidence, creativity and experience (both of doing research and of the context(s) being researched) are of great benefit.

Accordingly, the approach does not favour the novice researcher who may be just beginning to develop these qualities. This is not to say that novice researchers should not embark upon grounded theory studies; rather, it implies that (a) they are likely to find the approach more difficult than more conventional methodologies; and (b) the more experienced researcher is likely to produce better theory.

The researcher believes that social science method like grounded theory is useful in understanding social issue in organisational settings. However to apply the method successfully in a technical field like information systems requires a considerable knowledge of the method. It is important therefore, to fully understand the grounded theory perspective, and the rationale underpinning it, in order to apply it successfully to one's own research situation.

It is clear that at the beginning of the study the researcher's understanding of grounded theory technique was insufficient, however, as the study progressed, the researcher gained more confidence and knowledge of the method from reviewing other social science research methods. And also in an attempt to bridge this knowledge gap, practical examples of successful application of grounded theory in the context of IS research were retrieved (Orlikowski, 1993; Urquhart, 1997; Howcroft, 1998; Hughes, 1998; Turner, 1983) and these proved to be invaluable sources of guidance. Additionally, many discussions with my supervisor helped to clarify questions I had about the qualitative approach and some of the various research methodologies. The grounded theory method was adapted for the analysis process to suit the focus of this study.

The important lesson learnt from this study relates to the author's learning about the research method and the research process in general. Clearly the most important lesson learned was that of being open and flexible. The author allowed himself to drop previous agendas in the light of the emerging data. Another significant lesson from this research has been the shift from naïve researcher to more knowledgeable

researcher. Although perhaps not unexpected the consequence of this is that issues emerged at the end of the process that should have been addressed during the process. For example, the author interviewed only one member of staff (owners/IT managers) in each of the SMEs cases, as opposed to interviewing different individuals in the organisation. The owner/IT manager was chosen as a single key informant within a firm, because the author believed they occupy roles that made them knowledgeable about the issues being researched and the researcher felt such a strategy would enable him to achieve a greater and more diverse sample size.

On reflection this was a mistake, cogent arguments can be made that a study of this nature should have interviewed multiple informants. Ideally future interpretive research should attempt to avoid this methodological pitfall by pragmatically obtaining multiple sources within a single organizations. The author should have investigated a smaller number of SMEs than the current number; this would have allowed the researcher to spend more time in the examined organisations and interview different people to get different perspectives on the adoption and use of the Internet. Furthermore, the case study should have been conducted first in fewer SMEs, then the cases used to generate the content of the survey and the survey used to test the concepts that emerged from the case study.

Overall, this research might not be considered a pure interpretivist research; however, the research was led by interpretivist principles. The author believes that the interpretive approach is one of the best strategies available for studying complex phenomena such as the adoption and use of the Internet in business. The reward clearly appears to be a deeper and broader understanding of the factors that influence adoption of the Internet and the ability to contribute significantly to cumulative knowledge in the IS field.

"Having made a discovery, I shall never see the world again as before. My eyes have become different; I have made myself into a person seeing and thinking differently. I have crossed a gap, the heuristic gap, which lies between problem and discovery" (Polanyi, 1962).



## 7.10 Conclusion

The central concern of this study has been in gaining deep insight into current Internet usage in SMEs and the factors that influence their decision to adopt it in business.

This study, which was based on empirical data, examined Internet usage as it is actually used in SMEs. The study has developed a theory that considered the technological, organisational and environmental factors, which explained the adoption and use of the Internet in SMEs. The author has argued both theoretically and where possible using empirical evidence, why these categories helped to better understand and explain Internet adoption and usage in SMEs. The study's results provided significant support to past findings in innovation and information systems literature.

The study was presented in a descriptive form and chronicles the perceptions and experiences of SMEs adoption and use of the Internet in business. Zeller (1991) suggests that studies with an interpretive perspective don't report out "data", they report "scenes" i.e. accounts of researchers' engagement over time with participants in their surroundings (Zeller, 1991 cited in Miles and Huberman, 1994). In addition, Hammersley (1992) argues that "an account is valid or true if it represents accurately those features of the phenomenon that it is intended to describe, explain or theorise". The study has presented the current picture of how SMEs used the Internet in practice and the factors that influenced their decision to adopt the Internet in business. It has told story of Internet adoption and use from the perspective of the surveyed respondents and the SME cases examined.

The conclusions of the study were based on the survey questionnaire and the analysis of the SMEs studied and not on a population. It is not the goal of an interpretive study to make generalisations from the examined SMEs, but rather to offer understanding or insights about the adoption and use of the Internet in SMEs. A rich, thick description of the case allows readers to make decisions regarding transferability of the research (Merriam, 1988). This study has presented significant progress in Internet usage and toward explaining the factors influencing the adoption of the Internet in SMEs. The findings provided theoretical and practical insights into the adoption and use of the Internet in SMEs. The study has contributed to the existing body of research on IT usage in general and Internet usage in particular. Finally, the research reported here

contributes to what is hoped will be a continually expanding body of empirical evidence that can increase knowledge of Internet technology usage in business.

7

## BIBLIOGRAPHY

- Abell, W., and Lim, L., (1996), *Business use of Internet in New Zealand: An Exploratory Study*, <http://www.scu.edu.au/ausweb96/buiness/abell/paper.htm>
- Abell, W., and Black, S., (1997), *Business use of Internet in New Zealand: A Follow-up Study*, <http://www.lincoln.ac.nz/ccb/staff/abell/webnet.htm>
- Adams, D.A., Nelson, R.R., and Todd, P.A., (1992), *perceived usefulness, ease of use and usage of information technology: replication*, MIS Quarterly, June, pp.227-247
- Ajzen, I., and Fishbein, M., (1980), *Understanding attitudes and predicting social behaviour*, Prentice-Hall, Englewood Cliffs, New Jersey
- Anderson, J.A., (1987), *Communication research: Issues and methods*, McGraw-Hill, New York
- Andreu, Ricart and Valor (1997), *Process Innovation: Changing Boxes or Revolutionising Organisations?* Knowledge and Process Management, 4 (2), pp 114-125
- Angehrn, A. A., (1997), *The Strategic Implications of the Internet*, in Galliers, R., Murphy, C., Hansen, H.R., O'Callaghan, R., Carlsson, S., and Loebbecke, C., (Eds.), Proceedings, ECIS, Cork
- Angell, I.O., and Smithson, S., (1989), *Managing Information Technology: A crisis of Confidence?* Department of Information Systems, London School of Economics and Political Science, working paper series 20
- Antonelli, C.A., (1992), *The economic theory of information networks*, In Antonelli, C.A (ed.), the economics of information networks, Amsterdam, north Holland, pp. 5-27
- Applegate, L.M., (1994), *Managing in an information age: transforming the organisation for the 1990s*, In R. Baskerville, S. Smithson, O. Ngwenyama and J.I. DeGross (eds.), transforming organisations with information technology north Holland, Amsterdam, pp. 15-94
- Attwell, P., (1992), *Technology diffusion and organisational learning*, Organisational science, (3:1), pp. 1-19
- Attwell, P., and Rule, J., (1984), *Computing and organisation: What we know and what we don't know*, Communications of ACM, vol.27, December, pp. 1184-1192
- Auffret, J., and Matsuura, J.H., (1998), *Technological Change, Telecommunications Deregulation, Telecommunications Economics, and Internet Globalisation*, <http://www.isoc.org/inet98/proceedings>.

- Auger, P., and Gallagher, J., (1997), *Factors affecting the adoption of an Internet-based sales presence for small businesses*, *The Information society*, 13, pp. 55-74
- Avison, D.E., Kendall, J.E., and DeGross, J.I., (1993), *Human, organisational and social dimensions of information systems development*, North-Holland, Amsterdam
- Bachrach S. M., (1996), *The Internet: A Guide for Chemists*, American Chemical Society
- Bakos, Y., (1998), *The emerging role of electronic marketplace on the Internet*, *Communication*, vol. 41, No. 8.
- Bakos, Y., (1991), *A strategic analysis of electronic marketplaces*, *MIS Quarterly*, vol. 15, no. 3, pp. 295-310
- Barker, N., Fuller, T., and Jenkin, A., (1997), *Small firms experiences with the Internet*, Proceedings of the 20<sup>th</sup> ISBA National conference, Belfast, Northern Ireland
- Barker, N., (1994), *The Internet as a reach generator for small business*, Unpublished Master thesis, Business school, University of Durham
- Baker, T.L., (1994), *Doing Social Research*, McGraw-Hill Book Co., Singapore.
- Banville, C., and Landry, M., (1992), *Can the Field of MIS be Disciplined*, In *Information Systems Research*, Galliers, R., (ed.), Alfred Waller Ltd, Oxfordshire
- Barley, S., (1986), *Technology as an occasion for structuring: evidence from observations of CT scanners and the social order of radiology departments*, *Administrative Science Quarterly*, 31, No. 1, 78-108
- Baroudi, J.J., Olson, M.H., and Ives, B., (1986), *An empirical study of the impact of user involvement on system usage and information satisfaction*, *Communication of ACM*, 29, pp. 232-238
- Barrett, M.I., and Walsham, G., (1995), *using IT to support business innovation: A case study of the London Insurance market*, *Scandinavian journal of information systems*, 7 (2)
- Baskerville, R., and Wood-Harper, A.T., (1998), *Diversity in Information Systems Action Research Methods*, *European journal of Information Systems*, 7, pp.90-107
- Baskerville, R., (1996), *The second Order Security Dilemma*, in W.J. Orlikowski, G. Walsham, M.R. Jones, and J.I. DeGross (eds.), *Information technology and Changes in Organisation Work*, Chapman and Hall, London.

- Bayer, J., and Melone, N., (1989), *A critique of diffusion theory as a management framework for understanding adoption of software engineering innovations*, Journal of systems and software, vol. 9, pp. 161-166
- Behrendorff, G. and Goldsworthy, M., (1996), *Electronic commerce for Small to Medium Sized Enterprises*, Centre for Electronic Commerce, Monash University, Australia
- Benbasat, I., Ives, B., and Piccoli, G., (2000), *Electronic commerce top research questions A survey of the IS world community*, <http://isds.bus.Isu.edu/cvoc/isworld/ecommtop.htm>
- Benbasat, I., Goldstein, D. K., and Mead, M., (1987), *The Case Research Strategy in Studies of Information Systems*, *MIS Quarterly*, volume 11, number 3, September, pp. 369-385.
- Benbasat, I., and Dexter, A.S., (1986), *An investigation of the effectiveness of colour and graphical presentation under varying time constraints*, *MIS Quarterly*, March, pp. 59-84
- Benbasat, I., Dexter, A.S., and Todd, P., (1986), *An experimental program investigating colour-enhanced and graphical information presentation: An integration of the findings*, *Communication of ACM*, 29, pp. 1094-1105
- Bevan, N., (1997), *Usability issues in web site design*, [www.npl.co.uk/sections/us](http://www.npl.co.uk/sections/us)
- Bhattacharjee, A., (1996), *Explaining the effect of incentives and control mechanism on information technology usage: A theoretical model and empirical test*, In proceedings of the seventeenth international conference on information systems, J.I. DeGross, S. Jarvenpaa and A. Srinivasan (eds.), Cleveland, OH, pp. 307-325
- Blili, S., and Raymond, L., (1993), *Information technology: threats and opportunities for small and medium enterprises*, *International journal of information management*, vol. 13, pp. 439-448
- Bloch, M., and Segev, A., (1996), *The Impact of Electronic Commerce on the Travel Industry: An Analysis Methodology and Case Study*, <http://www.hec.unil.ch/mbloch/docs/travel/travel.htm>
- Bloch, M., Pigneur, Y., and Segev, A., (1996), *On the Road of Electronic Commerce A Business Value Framework, Gaining Competitive Advantage and Some Research Issues*, <http://www.hec.unil.ch/mbloch/docs/roadtoec/ec.htm>
- Bloch, M., and Pigneur, (1995), *The extended enterprise: a descriptive framework, Some enabling technologies and case studies in the Lotus Notes environment*, [http://www.hec.unil.ch/mbloch/docs/paper\\_ee/paper\\_ee.htm](http://www.hec.unil.ch/mbloch/docs/paper_ee/paper_ee.htm).
- Bloor, R., (1998), *Internet to become dominant medium*, *Computing*

- Bogdan, R.C., and Biklen, S.K., (1982), *Qualitative research for education: An introduction to theory and methods*, Allyn and Bacon, Boston.
- Boland, R., Jr. (1991), *Information System Use as a Hermeneutic Process*, in *Information Systems Research: in contemporary approaches and emergent traditions*, H.E. Nissen, H. K. Klein, and R. Hirschheim (eds.), Elsevier science publishers, 439-458, North-Holland.
- Bonoma, T.V., (1985), *Case Research in Marketing: Opportunities, Problem, and a Process*, *Journal of Marketing Research*, 22, 2, May, pp.199-208.
- Boudreau, M.C., and Robey, D., (1999), *Organisational transition to enterprise resource planning systems: Theoretical choices for process research*, Twentieth international conference on information systems, pp. 291-299
- Boynton, A.C., Zmud, R.W., and Jacobs, G.C., (1994), *The influence of IT management practice on IT use in large organisation*, *MIS Quarterly*, volume 18, number 3, pp 299-318
- Bracheau, J.C., and Wetherbe, J.C., (1990), *The adoption of spreadsheet software: testing innovation diffusion theory in the context of end-user computing*, *Information systems research* (1:2), pp. 115-143
- Broadbent, M., and Butler, C., (1997), *Managing information technology infrastructure capability for international business operations*, proceedings of the pacific Asia conference on information systems, Brisbane, Australia
- Brown, J.S., and Paul Duguid, (1996), *The social life of documents*, <http://www.firstmonday.dk/issues/issue1/documents/index.html>
- Burgess, L., and Cooper, J., (1999), *A Model for Classification of Business Adoption of Internet Commerce Solution*, Twelfth Bled Electronic Commerce Conference, Global Networked Organisations, Bled, Slovenia
- Burnes, B (1996), *Managing Change: A strategic approach to Organisational Dynamics*, 2<sup>nd</sup> Edition, Pitman Publishing
- Burrell, G., and Morgan, G., (1979), *Sociological Paradigms and Organisational Analysis*, Heinemann, London.
- Butler, P. and Peppard, J., (1997), *Consumer purchasing on the Internet: Processes and Prospects*, School of Business Studies, Trinity College, Dublin.
- Cameron, J., and Clarke, R., (1996), *Towards a Theoretical Framework for Collaborative Electronic Commerce Projects involving Small and Medium-Sized Enterprises*, Proc. 9<sup>th</sup> Int'l Conf. EDI-IOS, Bled, Slovenia.

- Cantrell, D.C., *Alternative Paradigms in Environmental Education Research: The Interpretive Perspective*,  
<http://www.edu.uleth.ca/ciccte/naceer.pgs/pubpro.pgs/alternate/pubfiles/08.Cantrell.fin.htm>
- Carlson, J. R. and Zmud, R. W., (1994), *Channel Expansion Theory: A Dynamic View of Media and Information Richness Perceptions*, Academy of Management, Best Papers, pp. 280-284.
- Carroll and Swatman, (2000) *structured case: A methodological framework for building theory in information systems research*, proceedings of the 8<sup>th</sup> European conference on information systems, Vienna, Austria
- Cash, J.I., McFarlan, F., and McKenney, J.L., (1988), *Corporate Information Systems Management: Texts and Cases*, Irwin, Homewood, IL
- Castleman, T., Swatman, P.A., and Swatman, P.M.C., (2000), *The role of Government in Internet commerce: Views from the fields*, 13<sup>th</sup> International Bled Electronic conference, Bled, Slovenia
- Cavaye, A.L.M., (1996), *Case Study Research: A Multi-faceted Research Approach for IS*, Info Systems Journal, 6, 227-242.
- Chappell, C., Feindt, S., and Jeffcoate, J., (1999), *Gazelles and Gopher: SME recommendations for successful Internet business*, <http://kite.tsa.de>
- Chappell, C., and Feindt, S., (1999), *Analysis of E-commerce practice in SMEs*, <http://kite.tsa.de>
- Charmaz, K., (1983), *The Grounded Theory Method: An Explication and Interpretation*, in Emerson, R.M. (ed.) *Contemporary Field Research*, Waveland Press Inc., Illinois
- Charmaz, K., (1980), *The construction of self pity in the chronically ill*, *Studies in Symbolic Interaction*, volume 3, pp 123-145
- Chatfield, A.T., and Alston, M., (1997), *Small and medium enterprises in electronic commerce: A case study of barriers to financial EDI adoption*, proceedings of 5<sup>th</sup> European conference on Information systems, Cork, Ireland, June, pp. 1219-1233
- Chatterjee, D., and Sambamurthy, V., (1999), *Business Implications of Web Technology: An Insight into Usage of the World Wide Web by US Companies*, *The International Journal of Electronic Commerce and Media*, Volume 9, (1/2): 9-13
- Cerf, V.G., (1995), *Computer Networking: Global Infrastructure for the 21<sup>st</sup> Century*, <http://cra.org/research.impact>

- Chen, J.C., and Williams, B., (1993), *The impact of microcomputer systems on small businesses: England, 10 years later*, Journal of small business management, July, pp. 96-102
- Chesher, M., (1997), *Impact of Emerging Technologies on Companies in Sustaining Competitive Advantage*, 7<sup>th</sup> BIT Conference Manchester Metropolitan University, UK.
- Clarke, R., (1997), *Promises and Threats in Electronic Commerce*, <http://www.anu.edu.au/Roger.Clarke/EC/Quantum.html>
- Clarke, R., (1996), *Issues in Technology-Based Consumer Transactions*, <http://www.anu.edu.au/Roger.Clarke/SOS/SCOCAP96.html>
- Clarke, R., (1994), *EDI Adoption and Usage in Australian Government Agencies*, <http://www.anu.edu.au/Roger.Clarke/EC/Brighton94.html>
- Clarke, R., (1994), *Empirical Research Methods - in Electronic Commerce Notes Following the Bled Conference and Uni. Linz Presentations*, <http://www.anu.edu.au/Roger.Clarke/ISRes/INFSResMeth>
- Clemente, P.C., (1998), *State of the Net: The new Frontier*, McGraw-Hill, London, England
- Clemons, E.K., Reddi, S.P., and Row, M.C., (1993), *The impact of IT on the organisation of economic activity: the move to the middle hypothesis*, Journal of management information systems, 10:2, fall 1993, pp. 9-36
- Clemons, E.K., (1986), *Information system for sustainable competitive advantage*, Information and Management, 11 (3), pp. 131-136
- Clemons, E.K., and McFarlan, W.F., (1986), *Telecom: Hook or lose out*, Harvard Business Review, 64, 4, pp. 91-97
- Clinton, W.J. and Gore, A. Jr., (1996), *A Framework for global electronic commerce*, <http://www.iitf.nist.gov/eleccomm.html>
- Clowes, K. W., (1982), *the impact of computers on managers*, in management information systems, no. 2, (ed.), Gray Dickson, Umi research press, Ann Arbor, Michigan
- Cockburn, C., and Wilson, T.D., (1996), *Business use of the World Wide Web*, International Journal of Information Management, 16, 2, pp. 83-102
- Cohen, W.M., and Levinthal, D.A., (1990), *Absorptive capacity: A new perspective on learning and innovation*, Administrative Science Quarterly, 35, pp. 128-152
- Coleman, J.S., (1994), *Foundations of social theory*, The Belknap press of Harvard University press (first edition: 1990)



- Colins, P.D., Hage, J., and Hull, F.M., (1988), *Organisational and technological predictors of change in automacity*, *Academy of Management Journal*, 31, 3, pp. 512-543
- CommerceNet/Nielsen (1999), *UK Internet users*, <http://www.commercenet.org.uk>
- Contractor, N. S. and Eisenberg, E. M., (1990), *Communication Networks and New Media in Organisations*, in *Organisations and Communication Technology*, J. Fulk and C. W. Steinfield (eds.), Sage, Newbury Park, CA, pp. 117-140.
- Cooper, R. B., and Zmud, R. W., (1990), *Information Technology Implementation Research: A Technological Diffusion Approach*, *Management Science* (36:2), pp. 123-139
- Corbitt, B.J., and Kong, W., (2000), *Issues affecting the implementation of electronic commerce in SMEs in Singapore*, 13<sup>th</sup> International Bled Electronic conference, Bled, Slovenia
- Craig, P., King, M., (1993), *Small-firm computing: Motivators and Inhibitors*, *MIS Quarterly* (March), pp. 47-59
- Creswell, J., (1994), *Research design: Qualitative and quantitative approaches*. London: Sage.
- Cronin, M.J., (1995), *Doing more Business on the Internet: How the Electronic Highway is transforming American Companies*, Van Nostrand Reinhold, New York
- Culnan, M.J., and Markus, M.L., (1987), *Information technologies*, in F.M. Jablin, L.L.Putnam, K.H.Roberts and L.W. Porter (eds.), *Handbook of organisational communication*, Sage, Newbury park, CA, pp. 420-443
- Curran, J., Jarvis, R., Blackburn, R.A., and Black, S., (1993), *Networks and small firms: Constructs, Methodological strategies and some findings*, *International small business journal*, vol. 11, Issue 2, Jan-Mar, pp. 13-25
- Currie, W., (1998), *Electronic commerce: the new paradigm for business?*
- Daft, R.L., (2001), *Organisation theory and design*, West publishing company, St Paul, MN
- Daft, R.L., Lengel, R.H., and Trevino, L.K., (1987), *Message equivocality, media selection and manager performance: Implication for information systems*, *MIS quarterly*, volume 11, no. 3, pp. 355-366
- Daft, R. L. and Lengel, R. H., (1986), *Organisational Information Requirements, Media Richness and Structural Design*," *Management Science* (32:5), 1986, pp. 554-571.

- Daft, R.L., and Lengel, R.H., (1984), *Information richness: A new approach to managerial behaviour and organisational design*, In B. Staw and L.Cummings (eds.), *Research in organisational behaviour*, 6, pp. 191-233
- Daft, R.L., and Weick, K.E., (1984), *Towards a model of organisation as interpretation systems*, *Academy of management review*, 9, pp. 284-295
- Daft, R.L., and Macintosh, N.B., (1981), *A tentative exploration into the amount and equivocality of information processing in organisational work units*, *Administrative science Quarterly* volume 26, pp. 207-224
- Daft, R.L., (1978), *A dual core model of organisation innovation*, *Academy of Management Journal*, 21, 2, pp. 193-210
- Damanpour, F., (1991), *Organisation innovation: A meta-analysis of effects of determinants and moderators*, *Academy of Management Journal*, 34, 3, pp. 555-590
- Danzinger, J.N, (1985), *Social science and social impacts of computer technology*, *Social science quarterly*, 66:1, pp. 3-21
- Darke, P., Shanks, G., & Broadbent, M., (1998), *Successfully completing case study Research: Combining rigour, relevance and pragmatism*, *Info Systems Journal*, 8, 273-289
- Davies, L., and Mitchell, G., (1994), *The dual nature of the impact of IT on organisational transformations*, In *transforming organisations with information technology*, R. Baskerville, S. Smithson, O. Ngwenyama and J.I. DeGross (eds.), north Holland, Amsterdam, pp. 243-262
- Davis, F. D., (1989), *Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology*, *MIS Quarterly* (13), pp. 319-340.
- Davis, F. D., Bagozzi, R. P., and Warshaw, P. R., (1989), *User Acceptance of Computer Technology: A Comparison of Two Theoretical Models*, *Management Science* (35:8), pp. 982-1003
- De Búrca, S., and McLoughlin, D., (1996), *The Grounded Theory Alternative in Business Network Research*, [http://www.dcu.ie/business/research\\_interests.html](http://www.dcu.ie/business/research_interests.html)
- DeLone, W.R., and McLean, E.R., (1992), *Information systems success: the quest for the dependent variable*, *Information systems research*, vol. 3, no. 1, pp. 60-95
- DeLone, W., (1988), *Determinants of success for computer usage in small business*, *MIS Quarterly* (March), pp. 50-61
- Denzin, N.K., (1994), *The Art and Politics of Interpretation*, in Denzin, N.K, and Lincoln, Y.S, (ed.), *Handbook of Qualitative Research*, Sage, London

- Denzin, N.K., (1989), *The Research Act: A Theoretical Introduction to Sociological Methods*, 3<sup>rd</sup> (ed.), Prentice-Hall, Inc., Englewood Cliffs, New Jersey.
- Department of Trade and Industry, (DTI), (1997, 1998, 1999), *moving Into the Information Age: An International Benchmarking Study*.
- Department of Trade and Industry, (1999), *How the Internet can work for you*
- DeSanctis, G., (1983), *Expectancy theory as an explanation of voluntary use of a decision support system*, *Psychological Reports*, 52, pp. 247-260
- Deschoolmeester, D., and Hee, J.V., (2000), *SMEs and the Internet: on the strategic drivers influencing the use of the Internet in SMEs*, 13<sup>th</sup> International Bled Electronic conference, Bled, Slovenia
- De Vaus, D.A., (1991), *Survey in Social Research*, 3<sup>rd</sup> (ed.), UCL Press.
- Dey, I., (1993), *Qualitative Data Analysis: A user-friendly guide for social scientists*, Routledge, London
- Dickson, J.W., (1976), *The adoption of innovative proposals as a risky choice - A model and some results*, *Academy of Management Journal*, 19, 2, pp. 291-303
- Doll, W.J., and Torkzadeh, G., (1988), *The measurement of end-user computing satisfaction*, *MIS Quarterly*, June, pp. 259-274
- Dopson, S., and R. Stewart, (1993), *Information technology, organisational restructuring and the future of middle management*, *New technology, work and employment*, 8 (1), pp. 10-20
- Drury, D.H., and Farhoomand, A., (1996), *Innovation adoption of EDI*, *Information resources management journal*, pp. 5-13
- Dutta, S., and Evrard, P., (1998), *European small enterprise information technology study*, INSEAD Working Paper 98/06/TM
- Easterby-Smith, M., Thorpe, R., and Lowe, A., (1991), *Management research: An introduction*, Sage, London
- Edelheit, J.A., and Miller, M.R., (1997), *Electronic Commerce Comes to the Net*, *BT Technology*, Volume 15, no. 2
- Eisenhardt, K.M., (1989), *Building theories from Case Study Research*, *Academy of Management Review*, volume 14, number4, pp. 532-550
- Ellsworth, J., and Ellsworth, M., (1995), *marketing on the Internet: Multimedia Strategies for the World Wide Web*, John Wiley & Sons Inc., New York

- El-Shinnawy, M. M. and Markus, M. L., (1992), *Media Richness Theory and New Electronic Communication Media: A Study of Voice Mail and Electronic Mail*, Proceedings of the Thirteenth International Conference on Information Systems, J. I. DeGross, J. D. Becker, and J. J. Elam (eds.), Dallas, TX, pp. 91-105
- Ettlie, J.E., and Reza, E.M., (1992), *Organisational integration and process innovation*, Academy of Management Journal, 35, 4, pp. 795-827
- Ettlie, J.E., (1986), *Implementing manufacturing technologies: Lessons from experience*, in D. Davis et al., (eds.), *Managing technological innovation*, Jossey-Bass, San Francisco, pp. 72-104
- Ettlie, J.E., Bridges, W.P., and O'Keefe, R.D., (1984), *Organisation strategy and structural differences for radical versus incremental innovations*, Management science, vol. 30, no. 6, pp. 682-695
- Ettlie, J.E., and Bridges, W.P., (1982), *Environmental uncertainty and organisational technological policy*, IEEE Transactions on Engineering Management, 29, pp. 2-10
- European commission, (1998), *Awareness creation activities in electronic commerce for SMEs*, 2<sup>nd</sup> edition, <http://ispo.cec.be/ecommerce/books/awarenessbook.html>
- European observatory for SMEs, (1999), *Annual report*, European network for SMEs research
- Fariselli, P., Oughton, C., Picory, C., and Sugden, R., (1997), *Electronic commerce and the future for SMEs in a global marketplace: networking opportunities and public policy requirements*, First Annual Conference on Global Marketplace for SMEs, Bonn, Germany, <http://www.ispo.cec.be/Ecommerce/doc4.htm>
- Fichman, R. G., (1992), *Information Technology Diffusion: A Review of Empirical Research*, in Proceedings of the Thirteenth International Conference on Information Systems, J.I. DeGross, J. D. Becker, and J. J. Elam (eds.), Dallas, TX, pp. 195-206.
- Finlay, P.N., and Mitchell, A., (1994), *Perceptions of the benefits from the introduction of CASE: An empirical study*, MIS Quarterly, vol. 18, no. 4, pp. 353-369
- Fitzgerald, B., and Howcroft, D., (1998), *Towards Dissolution of the IS Research Debate: From Polarisation to Polarity*, Journal of Information Technology, 13, pp.313-326.
- Floyd, S., (1988), *A micro level model of information technology use by managers*, in U.E. Gattiker and L. Lawwood (eds.), *Managing technological development: Strategic and human resources issues*, De Gruyter, Berlin, pp. 123-142
- Frambach, R.T., (1993), *An integrated model of organisational adoption and diffusion of innovation*, European journal of marketing, 27, 5, pp. 22-41

- Fulk, J. and DeSanctis, G., (1995), *Electronic communication and changing organisational form*, *Organisational science*, vol. 6 No. 4, pp.338-49
- Fulk, J., (1993), *Social construction of communication technology*, *Academy of management journal*, vol. 36, no. 12, pp. 921-950
- Fulk, J., and Boyd, B., (1991), *Emerging theories of communication in organisation*, *Journal of management*, 17:2, pp. 407-446
- Fulk, J., Schmitz, J., and Steinfield, C.W., (1990), *A social influence model of technology use*, In Fulk, J and Steinfield, C (eds.), *Organisations and communication technology*, Sage publication, London, pp. 117-140
- Fulk, J., and Ryu, D., (1990), *perceiving electronic mail systems: A partial test of the social information processing model of communication media use in organisation*, paper presented to international communication association, Dublin, Ireland
- Fulk, J., Steinfield, C.W., Schmitz, J., and Power, J.G., (1987), *A social information processing model of media use in organisations*, *Communication research*, vol.14, no. 5, pp.529-552
- Fuller, T., and Jenkins, A., (1995), *Public Intervention in Entrepreneurial Innovation and Opportunism: Short Cuts or Detours to the Information Superhighway?* Babson Entrepreneurship Conference, London Business School, London, UK
- Gable, G.G., (1994), *Integrating case study and survey research methods: an example in information systems*, *European Journal of Information Systems*, volume 3, no. 2, pp. 112-126
- Galliers, B., and Swan, J., (1999), *Information systems and strategic change: A critical review of business process reengineering*, In Currie, W and Galliers, B, *Rethinking management information systems*, Oxford University press, pp. 360-387
- Galliers, R.D., (1993), *Research Issues in Information Systems*, *Journal of Information Technology*, 8, pp. 92-98
- Galliers, R.D., (1992), *Choosing Information Systems Research*, in *Information Systems Research*, Galliers, R., (ed.), Alfred Waller Ltd, Oxfordshire.
- Galliers, R.D., (1985), *In search of a paradigm for information systems research*, in *Research Methods in Information Systems*, E. Mumford et al (eds.), Elsevier science publishers, pp 281-297, North-Holland.
- Garcia, L. and Quek, F., (1997), *Qualitative Research in Information Systems: Time to be Subjective*, In A.S.Lee, J.Liebenau, and J.I DeGross (editors), *Proceedings of the IFIP International Conference on Information Systems and Qualitative Research*, Philadelphia, Pennsylvania.

- Garcia-Sierra, A., (1996), *Electronic Commerce and the Internet*,  
<http://www.cf.ac.uk/uwcc/masts/ecic/netcom.html>
- Gatignon, H., and Robertson, T. S., (1989), *Technology diffusion: An empirical test of competitive effects*, *Journal of marketing*, volume 53, pp. 35-49
- Gefen, D., and Straub, D. W., (1997), *Gender differences in the perception and use of email: an extension to the technology acceptance model*, *MIS Quarterly*, December
- Gelderman, M., (1998), *The relation between satisfaction, usage of information systems and performance*, *Information and Management*, 35, pp. 11-18
- George, A.L and McKeown, T.J., (1985), *Case studies and theories of organisational decision making*, in *advances in information processing in organisation (2)*, JAI press, Greenwich, CT, pp.21-58
- Global competitiveness report,  
[http://www.weforum.org/reports\\_pub.nsf/Documents/Home](http://www.weforum.org/reports_pub.nsf/Documents/Home)
- Gibbons, M.T., (1987), *Introduction: the politics of Interpretation*, in M.T. Gibbons (ed.), *Interpreting politics*, New York University Press, New York.
- Giddens, A., (1984), *The Constitution of Society*, Polity Press, Cambridge
- Giddens, A., (1979), *Central Problems in Social Theory*, Macmillan, London
- Ginzberg, M. J., (1980), *An organisational contingencies view of accounting and information systems implementation*, *Accounting, Organisation and Society (5)*, pp. 369-382
- Glaser, B.G., (1992), *Basics of Grounded Theory Analysis: Emergence versus Forcing*, Sociology press, San Francisco.
- Glaser, B.G., (1978), *Advances in the Methodology of Grounded Theory: Theoretical Sensitivity*, Sociology press, Mill Valley, California.
- Glaser, B.G., and Strauss, A.L., (1970), *Status Passage*, Aldine, Chicago
- Glaser, B.G., and Strauss, A.L., (1967), *The Discovery of Grounded Theory: Strategies for Qualitative Research*, Weidenfeld and Nicolson, London, England
- Golden, P.A., Beauclair, R., and Sussman, L., (1992), *Factors affecting email use*, *Computers in human behaviour*, 8:4, pp.297-311
- Golden, W., and Griffin, M., (2000), *the World Wide Web: saviour of small firms*, 13<sup>th</sup> International Bled Electronic conference, Bled, Slovenia

- Goldstein, D. K., Markus, M.L, Rosen, M. and Swanson, E.B., (1986), *Use of qualitative methods in MIS research*, proceedings of the seventh international conference on information systems, San Diego, CA, December, pp. 338-339
- Goodhue, D., (1986), *IS attitudes: towards theoretical definition and measurement clarity*, proceedings of the seventh International conference on information systems, San Diego, CA, December, pp. 181-194
- Graham, I., Spinardi, G. and Williams, R., (1996), *Diversity in the emergence of Electronic commerce*, Journal of Information technology, 11, 161-172
- Grant, R.A. (1989), *Building and testing a casual model of an information technology impact*. In proceedings of the International conference on information systems, De Gross, J (ed.), association of computing machinery, Boston, pp. 173-182
- Grint, K., and Woolgar, S., (1997), *The machine at work: technology, work and organisation*, Polity press, Cambridge
- Guba, E. G., and Lincoln, Y. S., (1989), *Fourth Generation Evaluation*, Sage, Newbury Park, CA
- Gupta, S., (1995), *HERMES: A research project on the commercial uses of the World Wide Web*, <http://www.umich.edu/~sgupta/hermes/>
- Gurbaxani, V., and Whang, S., (1991), *The impact of information systems on organisations and markets*, Communication of ACM, vol.34, no.1, pp. 59-73
- Gurbaxani, V., and Mendelson, H., (1990), *An integrated model of information systems spending growth*, Information Systems Research, volume 1, pp. 23-47
- Hagmann, C., and McCahon, C., (1993), *Strategic information systems and competitiveness*, Information and management, 25, pp. 183-192
- Hamill, J., and Gregory, K., (1997), *Internet marketing in the internationalisation of UK SMEs*, Journal of Marketing management, 13(1-3), pp. 9-28
- Hammersley, M., (1992), *What's wrong with ethnography? Methodological explorations*, Routledge, London
- Hammersley, M., and Atkinson, P., (1983), *Ethnography: Principle in Practice*, Tavistock, London
- Hart, P., and Saunders, C., (1997), *Power and trust: Critical factors in the adoption and use of electronic data interchange*, Organisation science, 8, 1, pp.23-42
- Hirschheim, R.A., (1992), *Information Systems Epistemology: A Historical Perspective*, in Information Systems Research, Galliers, R., (ed.), Alfred Waller Ltd, Oxfordshire

- Hirschheim, R. and Klein, H.K., (1992), *A Research Agenda for future Information Systems Development Methodologies*, chapter 14 in challenges and strategies for research in systems development, W.W.Cotterman and J.A.Senn (eds.), John Wiley & sons, London, 235-255.
- Ho, J., (1997), *Evaluating the WWW: A global study of commercial sites*, <http://www.ascusc.org/jcmc/vol3/issue1/ho.htm/>
- Hoffman, D.L., and Novak, T.P., (1996), *A New Marketing Paradigm for Electronic Commerce*, Paper submitted for the Special Issue on Electronic Commerce for the Information Society.
- Hoffman, D.L, Novak, T.P. and Chatterjee, P., (1995), *Commercial Scenarios for the Web: Opportunities and Challenges*, JCMC, Volume 1, Issue No. 3.
- Holm, P., and Karlgren, K., (1995), *Theories of meaning and different perspectives on information systems*, In proceedings of 3<sup>rd</sup> International working conference on Information system concepts, ISCO3, Marburg, Germany
- Howcroft, D., (1999), *The Hyperbolic Age of Information: An Empirical Study of Internet Usage*, *Information, Communication & Society*, 2:3, pp. 277-299
- Howcroft, D., (1998), *spanning the Spectrum from Utopia to Dystopia: An Interpretive Field Study of the Nature and Characteristics of Internet Usage*, Unpublished PhD thesis, UMIST, UK.
- Hsieh, C., and Lin, B., (1998), *Internet Commerce for Small Business*, *Industrial Management & Data Systems*, Volume 98, Issue No. 3
- Huber, G.P, (1990), *A theory of the effects of advanced information technologies on organisational design, intelligence, and decision making*, *Academy of Management review*, vol. 15, No.1, January, pp. 47-71
- Hughes, J., and Howcroft, D., (2000), *Grounded Theory: I mentioned it once but I think I got away with it*, UKAIS Conference, York
- Hughes, J., and Wood-Harper, T., (1999), *Systems development as a research act*, *Journal of information technology*, 14, 83-94
- Hughes, J., (1998), *The Development of the GIST (Grounding Information SysTems) Methodology: determining situated requirements in information systems analysis*, Unpublished PhD thesis, Information Systems Research Centre, University of Salford, UK.
- Hunt, S., and Morgan, R., (1995), *The comparative advantage theory of competition*, *Journal of Marketing*, vol. 59, pp. 1-15
- Iacovou, C., Benbasat, I., and Dexter, A., (1995), *Electronic Data Interchange and Small Organisations: Adoption and Impact of technology*, *MIS Quarterly*, 19(4): 465-485



- Igbaria, M., Zinatelli, N., Cragg, P., and Cavaye, A., (1997), *Personal computing acceptance factors in small firms: A structured equation model*, MIS Quarterly, September
- International Data Corporation, *Internet Commerce and Usage in Australia 1997-2002*, <http://www.idc.com.au/PR-ecom.htm>
- IITA Task Group, (1994), *Electronic commerce and the NII: Draft for public Comment*, [http://www.iitf.nist.gov:94/doc/Electronic\\_Commerce.html](http://www.iitf.nist.gov:94/doc/Electronic_Commerce.html).
- Ives, B., and Olson, M.H., (1984), *User involvement and MIS success: A review of research*, Management science, volume 30, no.5, pp 586-603
- Jarvenpaa, S., and Ives, B., (1991), *Executive involvement and participation in the management of information technology*, MIS Quarterly, volume 15, no. 2, pp 205-228
- Jayaratne, T., (1993), *Quantitative methodology and feminist research*, In M. Hammersley (Ed.), *Social research: Philosophy, politics and practice* (pp. 109-123). London: Sage.
- Jensen, M.C., (1983), *Organisation theory and methodology*, The Accounting review, April, pp. 319-339
- Jeoffrey, M. and Roberts, R., (1997), *The Challenge of Exploiting Electronic Commerce*, 7<sup>th</sup> BIT Conference, Manchester Metropolitan University, UK
- Jick, T. D., (1983), *Mixing Qualitative and Quantitative Methods: Triangulation in Action*, in qualitative methodology (Van Maanen J, ed.), pp 135-148, Sage, Beverly Hills, California.
- Johnston, R.B., and Gregor, S., (2000), *A structuration-like theory of industry-level activity for understanding the adoption of interorganisational systems*, Proceedings of the 8<sup>th</sup> European conference on information systems, Vienna, Austria
- Jones, I. (1997), *Mixing qualitative and quantitative methods in sports fan research*, The Qualitative Report, <http://www.nova.edu/ssss/QR/QR3-4/jones.html>
- Kalakota, R., and Whinston, A. B., (1996), *Frontiers of Electronic Commerce*, Addison-Wesley, Reading Mass
- Kambil, A., (1995), *Electronic commerce: implications of the Internet for business practice and strategy*, Business Economics, 30, 4, pp. 27-33
- Kang, S., (1998), *Information Technology Acceptance: Evolving with the Changes in the Network Environment*, Proceeding of IEEE 31<sup>st</sup> Hawaii international conference on system science, Hawaii

- Kanungo, S., (1993), *Information systems: Theoretical development and research approaches*, Journal of information systems, (18:8), pp. 609-619
- Kaplan, B., and Maxwell, J.A., (1994), *Qualitative Research Methods for Evaluating Computer Information Systems*, in Evaluating Health Care Information Systems: Methods and Applications, J.G. Anderson, C.E. Aydin, and S.J. Jay (eds.), Sage publications, Thousand Oaks, California, pp 45-68.
- Kaplan, B., and Duchon, D., (1988), *Combining Qualitative and Quantitative Methods in Information Systems Research: A Case Study*, MIS Quarterly, December, pp.571-586.
- Kaufmann, A., (1997), *Selling Meteorites on the Internet A Case Study on the Swiss Meteorite Laboratory*, in Galliers, R., Murphy, C., Hansen, H.R., O'Callaghan, R., Carlsson, S., and Loebbecke, C., (Eds.), Proc. ECIS, Cork.
- Kimbrough, S.O. and Lee, R.M., (1997), *Special Issue: Systems for Computer-Mediated Digital Commerce*, IJEC, Volume 1, no. 4, pp, 3-10.
- Klein, H.K., and Myers, M.D., (1999), *A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems*, MIS Quarterly, (23:1), pp 67-93.
- Klein, H., (1986), *The critical social theory perspective on information systems development*, proceeding of the 1986 Decision science institute, Honolulu, HA, November, pp. 575-577
- Kling, R., and Iacono, S., (1989), *The institutional character of computerised information systems*, Office, Technology and People, 5, No. 1, 7-28
- Kling, R., (1987), *defining the boundaries of computing across complex organisation*, In Critical Issue in Information Systems Research (eds.) R. Boland and R. Hirschheim), Wiley, New York
- Kling, R., (1980), *Social analyses of computing: theoretical perspectives orientations in recent empirical research*, ACM Computing surveys (12:1) March, pp. 61-110
- Konsynski, B.R., (1993), *A perspective on the case study approach in evaluating the business value of information technology*, In R.D. Banker, R.J. Kauffman and M. Mahmood (eds.), Strategic information technology management, Idea Group, publishing, pp. 15-24, Harrisburg, Pennsylvania
- KPMG Consulting, (1999), *Electronic commerce research report*, <http://www.kpmg.com>
- Kraemer, K. L., & Dutton, W. H., (1991), *Survey Research in the Study of Management Information Systems*, In the Information Systems Research Challenge: Survey Research Methods, Volume 3, (Kraemer, K. L., ed.), pp 3-34, Harvard Business School Press, Boston, Massachusetts.

- Kreps, G.L., (1990), *organisational communication: theory and practice*, White plains, Longman
- Kwon, T.H., (1990), *A Diffusion of Innovation Approach to MIS Infusion: Conceptualisation, Methodology and Management Strategies*, in J.I DeGross, M. Alavi and H.J. Oppelland (eds.), *Proceedings of the Tenth International Conference on Information Systems*, Copenhagen, Denmark, pp. 139-146
- Kwon, T.H., and Zmud, R.W., (1987), *Unifying the fragmented models of information systems implementation*, in *critical issues in information systems research*, R.J. Boland and R.A. Hirschheim (eds.), Wiley, New York
- Lacity, M.C., and Janson, M., (1994), *understanding qualitative data: A framework of text analysis methods*, *Journal of management information systems*, vol.11, no. 2, pp. 137-155
- Lawrence, J.E., and Hughes, J., (2000), *Internet usage by SME's: A UK perspective*, 13<sup>th</sup> International Bled Electronic Commerce Conference, Bled, Slovenia
- Lawrence, K.L., (1997), *the utilisation of electronic commerce facilities in Tasmania Small to medium-sized enterprises, factors inhibiting*, in Sutton D. (ed.), *proceeding of ACIS*, Adelaide
- Lee, A.S., Baskerville, R.L., Liebenau, J., and Myers, M.D., (1995), *judging qualitative research in information systems: criteria for accepting and rejecting manuscripts*, *Proceedings of the sixteenth International conference on information systems*, in J.I. DeGross, G.Ariav, C. Beath, R. Hoyer and C. Kemerer, (eds.), Amsterdam, The Netherlands, p 367
- Lee, A.S., (1994), *Electronic mail as a medium for rich communication: An empirical investigation using hermeneutic interpretation*, *MIS Quarterly*, June, 18:2, pp. 143-157
- Lee, A.S., (1991), *Integrating Positivist and Interpretive Approaches to organisational research*, *Organisational science*, (2:4), pp. 342-365
- Leedy, P.D., (1993), *Practical Research: Planning and Design*, Macmillan, New York
- Leiner, B. M., Cerf, V. G., Clark, D. D., Kahn, R. E., Kleinrock, L., Lynch, D. C., Postel, J., Roberts, L. G., and Wolfe, S., (1998), *A Brief History of the Internet*, <http://www.isoc.org/internet/history/brief.html>
- Lengel, R.H., and Daft, R.L., (1988), *The selection of communication media as an executive skill*, *Academy of Management Executive*, volume 2, no. 3, pp. 225-232
- Leonard-Barton, D., (1990), *A Dual Methodology for Case Studies: Synergistic Use of a longitudinal Single Site with Replicated Multiple Sites*, *Organisation Science*, volume 1, Number 3, pp.248-266

- Leonard-Barton, D., and Deschamps, I., (1988), *Managerial Influence in the Implementation of new technology*, Management Science, volume 34, pp. 1252-1265
- Leonard-Barton, D., (1987a), *The case for Integrative Innovation: An Expert System at Digital*, Sloan Management Review, volume 29, pp. 7-19
- Leonard-Barton, D., (1987b), *Implementing structured software methodologies: A case of innovation in process technology*, Interface, volume 17, pp. 6-17
- Levy, M., and Powell, P., and Yetton, P., (1998), *SMEs and the gains from IS: From cost reduction to value added*, In proceedings of IFIP 8.2/8.6, Helsinki, Finland, December
- Levy, M., and Powell, P., (1998), *Emerging Technologies: Can the Internet Add Value for SMEs?*
- Levy, M., and Powell, P., Merali, Y., and Galliers, R., (1997), *Assessing IS strategy development frameworks in SMEs*, In Murphy, C, Galliers, R, O'Callaghan, R and Loebekke, C (eds.), Proceedings of 5<sup>th</sup> European conference on information systems, Cork, June
- Lim, L., Gan, B., and Wei, K., (1998), *An integrated model on the adoption of the Internet for commercial purposes*, Proceedings of IEEE thirty first Hawaii international conference on systems science, Hawaii
- Lincoln, Y. S., and Guba, E. G., (1985), *Naturalistic Inquiry*, Sage, Newbury Park, CA
- Lotter, M., (1996), *Internet domain survey*, Network Wizards, <http://www.nw.com/>
- Lymer, A., Nayak, A., Johnson, R., and Spaul, B., (1998), *UK Business and the Information Superhighway: The Impact of the Internet on SMEs*, Certified Accountant Educational Trust for The Associations of Chartered Certified Accountants, London.
- Lymer, A., Johnson, R. and Baldwin, A., (1997), *The Internet and the Small Business: A study of impacts*, <http://www.isoc.org/inet98/proceedings>.
- MacGregor, R.C., Bunker, D.J., and Waugh, P., (1998), *Electronic Commerce and Small Medium Enterprises (SMEs) in Australia: an Electronic Data Interchange (EDI) Pilot Study*, Eleventh International Bled Electronic Commerce Conference, Bled, Slovenia.
- MacGregor, R.C., Waugh, P., and Bunker, D., (1996), *Attitudes of small business to the implementation and use of IT: Are we basing EDI design initiatives for small business on myths*, Ninth International conference on EDI-IOS, June, pp. 377-388

- MacGregor, R.C., and Cocks, R.S., (1994), *Computer usage and satisfaction in the Australian Veterinary Industry*, Australian veterinary practitioner, vol.25, no.1, pp.43-48
- Macintosh, N.B., and Scapens, R.W., (1990), *Structuration theory in management accounting*, Accounting, Organisations and Society, 15, No. 5, 455-477
- Malhotra, Y., (1997), *Reassessing & Clarifying Information Systems Acceptance & Usage*, Association for Information Systems, Third Americas Conference on Information Systems, Indianapolis, Indiana
- Malone, T., Yates, J., and Benjamin, R., (1987), *Electronic Markets and Electronic Hierarchies*, Communication of the ACM, 30(6): 484-497
- Markus, M.L., and Benjamin, R.I., (1997), *IT-enabled organisational change: New development for IS specialist*, In steps to the future: Fresh thinking on the management of IT-based organisational transformation, C. Sauer and P.W. Yetton (eds.), Jossey-Bass, San Francisco
- Markus, M.L., and Benjamin, R.I., (1997), *The magic bullet of theory in IT-enabled transformation*, Sloan Management review, 38, 2, winter, pp. 55-68
- Markus, M.L., (1994), *Electronic mail as the medium of managerial choice*, Organisational science, vol. 5, no. 4, pp. 502-527
- Markus, M.L., (1990), *Towards a critical theory of interactive media*, In Fulk, J, and Steinfield, Organisations and communication technology, sage, Newbury park, CA, pp. 194-218
- Markus, M.L. and Robey, D., (1988), *Information technology and organisational change: casual structure in theory and research*, Management science, (34:5), May, pp. 583-598
- Markus, M.L., (1988), *Information richness theory, managers, and electronic mail*, paper presented at the annual academy of management convention, Anaheim, California
- Markus, M.L., (1987), *Towards a critical mass theory of interactive media: Universal access, interdependence, and diffusion*, Communication Research, 14(5), October, pp. 491-511
- Markus, M.L., (1983), *Power, politics, and implementation*, Communication of ACM, vol.26, no.6, pp. 430-444
- Martin, P.Y., and Turner, B.A., (1986), *Grounded theory and organisational research*, Journal of Applied behavioural science, vol.22 (2), pp. 141-157
- Martin, C.J., (1989), *Information management in the smaller business: the role of the top manager*, International Journal of Information Management, pp. 187-197

- Mason, R.M., (1997), *SME adoption of electronic commerce technologies: Implication for emerging national information infrastructure*, Systems sciences, Proceedings of the thirtieth Hawaii international conference on information systems, pp. 495-504
- Masseti, B., and Zmud, R.W., (1996), *measuring the extent of EDI Usage in complex organisation: Strategies and illustrative examples*, MIS Quarterly, September
- Maxwell, J.A., (1996), *Qualitative research design: An iterative approach*, Sage press, Thousand Oaks, CA
- Maykut, P., and Morehouse, R., (1994), *Beginning qualitative research: A philosophic and practical guide*, Falmer Press London
- McFarlan, F.W, (1984), *Information technology changes the way you compete*, Harvard business review, 84, pp. 98-103
- Mcguiness, J., *The impact of e-commerce on small and medium-sized enterprises*, <http://www.johnmcguiness.com/ecommerce.html>
- McMaster, T., Vidgen, R.T., and Wastell, D.G., (1997), *Towards an understanding of technology in transition: Two conflicting theories*, in T. McMaster, E. Mumford, E.B. Swanson, B. Warboys and D.G. Wastell (eds.), *Facilitating technology transfer through partnership: Learning from practice and research*, IFIP TC8 WG 8.6, international working conference on diffusion, adoption and implementation of information technology, Ambleside, Cumbria, UK, pp. 64-75
- Michalski, J., (1995), *People are the killer application*, Forbes ASAP, June, pp. 120-122
- Miles, M. B., and Huberman, A. M., (1994), *An Expanded Sourcebook: Qualitative Data Analysis*, Sage Publications Inc., Thousand Oaks, California
- Miles, M. B., and Huberman, A. M., (1984), *Qualitative Data Analysis: A sourcebook of new methods*, Sage Publications Inc., Thousand Oaks, California.
- Millman, Z. and Hartwick, J., (1987), *The Impact of Automated office systems on middle managers and their work*, MIS Quarterly (11:4), December, pp. 479-490
- Mintzberg, H., and Quinn, J., (1991), *The strategy process: Concepts and cases*, 2<sup>nd</sup> edition, Prentice Hall
- Mitroff, I.I., Listone, H.A., (1993), *The Unbounded Mind*, Oxford University Press, New York
- Moore, G.C., and Benbasat, I., (1991), *Development of an instrument to measure the perceptions of adopting an information technology innovations*, Information Systems Research, volume 2, pp.192-222

- Morgan, G., (1983), *Beyond Method: strategies for social research*, Sage Publications, London
- Myers, M., (1997), *Interpretive research in information systems*, in J. Mingers and F. Stowell (eds.), *Information systems: An emerging discipline*, McGraw Hill, London, 239-266.
- Myers, M. D., (1997), *Qualitative Research in Information Systems*, *MISQ Discovery*, <http://www.misq.org/discovery>
- Nachmias, C., and Nachmias, D., (1982), *Without statistics, Research methods in the Social Sciences*, Alternate 2<sup>nd</sup> ed., Edward Arnold Publishers Ltd, London
- Narendran, P., Strom, J., and Whiteley, D., (1995), *An analysis of electronic markets in the context of SMEs*, Proceeding of the 3<sup>rd</sup> European conference on information systems, Athens, Greece, June, pp. 917-929
- Nau, D. (1995), *Mixing Methodologies: Can Bimodal Research be a Viable Post-Positivist Tool?* The Qualitative Report, <http://www.nova.edu/ssss/QR/QR2-3/nau.html>
- Nayak, A., Greenfield, S., (1996), *Computer use in micro businesses*, Paper presented at the 19<sup>th</sup> ISBA Conference Birmingham
- Naylor, J., and Williams, J., (1994), *The successful use of IT in SMEs on Merseyside*, *European Journal of Information Systems*, 3 (1), pp. 48-56
- Neches, R., Neches, A., Postel, P., Tenenbaum, J.M., Frank, R., (1994), *Electronic Commerce on the Internet*, <http://info.broker.isi.edu/fast/articles/EC-on-Internet.html>
- Neely, M., (1996), *The Expert's Business Guide to the Internet*, MaxiBooks, Kiama, NSW, Australia
- Network Wizards, (1997), *Internet domain survey*, <http://www.nw.com/zone/www/report.html>
- Ngwenyama, O.K., and Lee, A.S., (1997), *Communication Richness in Electronic Mail: Critical social theory and the contextuality of meaning*, *MIS Quarterly*, volume 21, number 2, pp. 145-167
- Ngwenyama, O., (1991), *The critical social theory approach to information systems: Problems and challenges*, in *information systems research: contemporary approaches and emergent traditions*, H.E. Nissen, H.Klein and R. Hirschheim (eds.), North Holland, Amsterdam, pp.267-280
- O'Callaghan, R., Kaufman, P.J., and Konsynski, B.R., (1992), *Adoption correlate and share effects of electronic data interchange systems in marketing channels*, *Journal of marketing*, vol. 56, pp. 45-56

- O'Connor, G.C., and O'Keefe, B., (1997), *viewing the web as a marketplace: the case of small companies*, *Decision Support Systems*, 21, 3, pp. 171-183
- OECD (2000a), *A new Economy: The changing role of innovation and information technology in growth*
- OECD (2000), *OECD Small and Medium Enterprise Outlook*, OECD publication services
- OECD, (1993), *Small and medium-sized enterprises: Technology and competitiveness*, OECD publication services
- Oftel SME survey, (2000), *Internet use among SMEs*, <http://www.oftel.gov.uk/cmu/research/brint1000.htm>
- Oliver, S., (1997), *A model for the future of electronic commerce*, *Information Management & Computer Security*, pp 166-169.
- Oinas-Kukkonen, H., (2000), *balancing the vendor and consumer requirements for electronic shopping systems*, *Information Technology and Management*, 2, 1, pp. 73-84
- O'Reilly & Associates, (1996), *Conducting business on the Internet*, <http://www.ora.com/survey/business>
- Orlikowski, W.J., and Hofman, J.D., (1997), *An improvisational model for change management: the case of GroupWare technologies*, *Sloan Management review*, winter, 38, 2, pp. 11-21
- Orlikowski, W.J., G.Walsham, M.R.Jones, and J.I.DeGross (1996), *Information technology and changes in organisational work*, Chapman and Hall, London
- Orlikowski, W.J., (1996), *Improvising organisation and transformation over time: A situated change perspective*, *Information systems research*, vol. 17, no.1, pp.63-92
- Orlikowski, W.J., (1993), *CASE tools as organisational change: Investigating incremental and radical changes in systems development*, *MIS Quarterly*, vol. 17, pp. 309-340
- Orlikowski, W.J., (1992), *The duality of technology: Rethinking the concept of technology in organisations*, *organisational science*, vol. 3 No.3, pp. 398-427
- Orlikowski, W.J., (1991), *Integrated information environment or matrix of control? The contradictory implications of information technology*, *Accounting, management and information technologies*, vol.1, no.1, pp. 9-42
- Orlikowski, W.J., and Robey, D., (1991), *Information technology and the structuring of organisations*, *Information systems research*, vol. 2, no. 2, pp. 143-169



- Orlikowski, W.J., and Baroudi, J.J., (1991), *Studying Information Technology in Organisations: Research Approaches and Assumptions*, Information Systems Research, 2:1, pp. 1-28.
- Pare, G., and Elam, J.J., (1997), *Using Case Study Research to Build Theories of IT Implementation*, In A.S.Lee, J.Liebenau, and J.I DeGross (editors), Proceedings of the IFIP International Conference on Information Systems and Qualitative Research, Philadelphia, Pennsylvania
- Patton, M.Q., (1990), *Qualitative evaluation and research methods*, sage publications, London
- Patton, M.Q., (1987), *How to use qualitative methods in evaluation*, Sage Publications, London
- Pettigrew, A., (1990), *Longitudinal field research on change: theory and practice*, Organisational science, 1:3, pp. 267-292
- Pettigrew, A.M., (1985), *Contextualist research and the study of organisational change processes*, in research methods in information systems, E.Mumford et al. (eds.), Elsevier science publishers, 53-79, North-Holland.
- Pfeiffer, H., (1993), *The diffusion of electronic data interchange*, Physica-Verlag, Heidelberg
- Pidgeon, N.F., Turner, B.A., and Blockley, D.I., (1991), *The use of grounded theory for conceptual analysis in knowledge elicitation*, International journal of Man-machine studies, vol.35 (2), pp. 151-173
- Pigneur, Y., (1996), *A Framework for designing new information systems*, <http://inforge.unil.ch/yp/pub/toFUNDP.htm>
- Pitt, L., Berthon, P., and Watson, R.T., (1996), *From surfer to buyer on the WWW: What marketing managers might want to know*, Journal of general management, 22, 1
- Poole, M.S., and Van de Ven, A.H., (1989), *Using paradox to build management and organisational theories*, Academy of management review, vol. 14, pp. 562-578
- Poon, S., and Swatman, P.M.C., (1999), *An exploratory study of small business Internet commerce issues*, Information and management, January, 35, pp. 9-18
- Poon, S., and Swatman, P.M.C., (1998), *A combined-method study of small business Internet commerce*, International journal of electronic commerce, 2, 3, spring, pp. 31-46
- Poon, S., and Swatman, P., (1998), *Small Business Internet commerce Experience: A Longitudinal Study*, Eleventh International Bled Electronic Commerce Conference, Bled, Slovenia

- on, S., and Strom, J., (1997), *Small Businesses' Use of the Internet: Some Realities*, [http://www.isoc.org/inet97/proceedings/C2/C2\\_1.htm](http://www.isoc.org/inet97/proceedings/C2/C2_1.htm)
- on, S., and Swatman, P.M.C., (1997), *Emerging Issues on Small Business Use of the Internet: 23 Australian Case Studies*, in Galliers, R., Murphy, C., Hansen, H.R., O'Callaghan, R., Carlsson, S., and Loebbecke, C., (Eds.), Proc. ECIS, Cork.
- on, S., and Swatman, P.M.C., (1997), *In-depth understanding on issues facing small business Internet use: A case study approach*, working paper series, Swinburne University of technology, Australia
- on, S., and Swatman, P., (1996), *Small business alliances: A framework for Internet-enabled strategic advantage*, Proceedings of the 29<sup>th</sup> Hawaii conference in systems science, Hawaii
- on, S., and Swatman, P., (1995), *The Internet for small businesses: Opportunities, government policies and implications*, Proceedings of the 5<sup>th</sup> Internet society conference, INET'95, Hawaii
- on, S., and Swatman, P.M.C., (1995), *The Internet for Small Business: An Enabling Infrastructure for Competitiveness*, Proceedings of the Fifth Internet Society Conference, (ed.) Chon K., Hawaii, pp 221-231
- orter, M.E., (1984), *Competitive Strategy: Creating and Sustaining Superior Performance*, Free Press, New York.
- orter, M.E., (1980), *Competitive Strategy, Techniques for Analysing Industries and Competitors*, Free Press, New York.
- erost, S., (1997), *The global information network for SMEs and Government on-line services for SMEs: Review of web sites and recommendations*, contribution of the OECD industry committee's working party on SMEs to the G7 global marketplace for SMEs conference, April, Bonn, Germany, <http://www.ispo.cec.be/Ecommerce/doc3.htm>
- PriceWaterhouse, (1997), *West Midlands Business survey*, Warwick business school & Wolverhampton business school
- Pries-Heje, J., (1992), *Three barriers for continuing use of computer-based tools in information systems development: a grounded theory approach*, Scandinavian journal of information systems, vol. 4, pp. 119-136
- Punch, K.F., (2000), *Developing effective research proposal*, Sage publication Ltd, London
- Quelsh, J.A., and Klein, L.R., (1996), *The Internet and international marketing*, Sloan management review, spring, pp. 60-75

- Ragin, C., and Zaret, D., (1983), *Theory and method in comparative research: two strategies*, social forces, 61, 3, pp 731-754.
- Ramamurthy, K., and Premkumar, G., (1995), *Determinants and outcomes of electronic data interchange diffusion*, IEEE Transactions on Engineering management, 42 (4), December, pp.325-347
- Ranchhod, A. and Hackney, R., (1997), *Global Marketing through Information Technology*, 7<sup>th</sup> BIT Conf. Manchester Metropolitan University, UK
- Raymond, L., (1985), *Organisational characteristics and MIS success in the context of small business*, MIS Quarterly, March, 9 (1), pp. 37-52
- Reich, B.H., and Benbasat, I., (1999), *Factors that influence the social dimension of Alignment between business and information technology objectives*, MIS Quarterly, pp. 1-59
- Reich, B.H., and Benbasat, I., (1996), *Measuring the linkage between business and information technology objectives*, MIS Quarterly, vol. 20, no.1, pp. 55-77
- Reich, B.H., and Benbasat, I., (1990), *An empirical investigations of factors influencing the success of customer-oriented strategic systems*, Information systems research, vol. 1, no. 3, pp. 325-347
- Reynolds, J., (1997), *The Internet as a strategic resource*, In Willcocks, L, Feeny, D, and Islei, G, (eds.), *Managing IT as a strategic resource*, McGraw Hill
- Rice, R. E., (1992), *Task Analysability, Use of New Media, and Effectiveness: A Multi-Site Exploration of Media Richness*," Organisation Science, 3, 4, pp. 475-500.
- Rice, R. E., and Shook, D. E., (1990), *Relationships of Job Categories and Organisational Levels to use of communication channels, including electronic mail: A Meta-Analysis and Extension*, Journal of Management Studies, 27, 2, March, pp. 195-229
- Rice, R. E., Grant, A., Schmitz, J., and Torobin, J., (1988), *A network approach to predicting the adoption and outcomes of electronic messaging*, Paper presented at the Annual Academy of Management Convention, Anaheim, California
- Ricciuti, M., (1995), *Database vendors hawk wares on Internet*, InfoWorld, 17, 2, pp. 10
- Riemenschneider, C. K., and McKinny V. R., (1999), *Assessing the Adoption of Web-based E-Commerce for Business: A research proposal and preliminary findings*, The International Journal of Electronic Commerce and Media, volume 9, (1/2): pp. 9-13.
- Riggins, F.J. and Rhee, H., (1997), *Toward a Unified View of Electronic Commerce*, <http://riggins-mgt.iac.gatech.edu/papers/unified.html>

- Robey, D., and Boudreau, M.C., (1999), *Accounting for the contradictory organisational consequences of information technology: Theoretical directions and methodological implications*, Information systems research, 10, 2
- Robey, D., (1995), *Theories that explain contradiction: accounting for the contradictory organisational consequences of information technology*, In J.I.DeGross, G.Ariav, C.M.Beath, R.W.Hoyer, and C.Kemerer (eds.), proceedings of the sixteenth international conference on information systems, Amsterdam, Netherlands, pp.55-63
- Robertson, T.S., and Gatignon, H., (1986), *Competitive effects on technology diffusion*, Journal of Marketing, volume 50, pp. 1-12
- Rockhart, J.F., and Scott Morton, M., (1984), *The implications of changes in information technology for corporate strategy*, Interfaces, 14, 84-95
- Rogers, E.M, (1983), *Diffusion of innovation*, 3<sup>rd</sup> edition, Collier Macmillan Publishers, London
- Rubinyi, R.M., (1989), *Computers and communicating: the organisational impact*, Journal of communication, 39:3, pp. 110-123
- Runge, D.A., and Earl, M.J., (1988), *Gaining competitive advantage from telecommunication*, in M. Earl (ed.), Information Management: the strategic dimension, Clarendon Press, Oxford, pp. 125-146
- Ryan, J., and Hepworth, M., (1991), *Building of an information society and its impact on SME growth*, In Scott Morton, M.S (ed.), The corporation of the 1990s, Oxford University Press
- Sanders, G.L., and Courtney, J.F., (1985), *A field study of organisational factors influencing DSS success*, MIS Quarterly, vol. 9, no. 1, pp. 77-93
- Saunders, C.S., and Clark, S., (1992), *EDI adoption and implementation: A focus on interorganizational linkages*, Information resource management journal, pp. 9-19
- Schmitz, J., and Fulk, J., (1991), *Organisational colleagues, media richness, and electronic mail: A test of the social influence model of technology use*, Communication research, 18 (4), pp. 487-523
- Schofield, P. A., (1997), *The World Wide Web: Marketing Communications and Improving Effectiveness*, 7<sup>th</sup> BIT Conf. Manchester Metropolitan University, UK
- Segars, A.H., and Grover, V., (1993), *Re-examining perceived ease of use and usefulness: a confirmatory factor analysis*, MIS Quarterly, December, pp. 517-525
- Seidel, J.V., (1998), *Qualitative Data Analysis*, [www.qualisresearch.com](http://www.qualisresearch.com)

- Senn, J.A., (1996), *Capitalising on electronic commerce: The role of the Internet in electronic markets*, Information systems management, summer, pp. 15-24
- Shanks, G., (1997), *The challenges of strategic planning in practice: An interpretive case study*, journal of strategic information systems, 6, pp. 69-90
- Shook, D.E., (1988), *A structural equivalence and contingency theory perspective on media usage and communication performance: The case of voice messaging*, Unpublished doctoral dissertation, University of Southern California, Los Angeles
- Sim, S.P., and Rudkin, S., (1997), *The Internet - Past, present and future*, BT Technology Journal, volume 15, no. 2
- Skevington, P.J., & Hart, T.P., (1997), *Trusted third parties in electronic commerce*, BT Technology Journal, volume 15, no. 2
- Skyrme, D., (1997), *The global knowledge economy and its implications for business*, <http://www.skyrme.com/insights/21gke.htm>
- Skyrme, D., *Internet Commerce: New Ways of Building Markets*, <http://www.skyrme.com/insights/21gke.htm>
- Soh, C., and Markus, M.L., (1995), *How IT creates business value: A process theory synthesis*, In J.I.DeGross, G.Ariav, C.M.Beath, R.W.Hoyer, and C.Kemerer (eds.), proceedings of the sixteenth international conference on information systems, Amsterdam, Netherlands, pp. 29-41
- Spradley, J.P., (1979), *The Ethnographic Interview*, Holt, Rinehart and Winston, New York
- Sproull, L., and Kiesler, S., (1986), *reducing social context cues: Electronic mail in organisational communication*, Management science, 32 (11), pp. 1492-1513
- Stegberg, T., and Lars Svensson, L., *How to use the Internet, when you don't have to, Internet use can increase goal fulfilment for a voluntary organisation*, <http://iris.informatik.gu.se/conference/iris20/41.htm>
- Steinfeld, C., Kraut, R., Plummer, A., (1996), *The Impact of Inter-organisational Networks on Buyer-Seller Relationships*, JCMC, volume 1 Issue No.3.
- Steinfeld, C.W., (1985), *Dimensions of electronic mail use in organisation*, in J. Pearce and R. Robinson (eds.), proceedings of the annual meeting of the academy of management, Academy of management, pp. 239-243
- Stephen, H., and Duncan, E., (1993), *Effective paradigms for small business in changing global economy: A case study of flexible manufacturing network*, <http://161.31.2.174/docs/proceedings/93sbi311.txt>

- Stroeken, J., Coumans, J., (1998), *The actual and potential use of information technology in small and medium sized enterprises*, Prometheus, 16 (4), pp.469-483
- Strauss, A.L, and Corbin, J., (1990, 1998), *Basics of Qualitative Research: Techniques and Procedures for developing Grounded Theory*, Sage Publications Ltd, London
- Strauss, A.L, (1987), *Qualitative Analysis for Social Scientists*, Cambridge University Press, Cambridge
- Sun, *How Sun save money, improves service using Internet technologies*, <http://sun.com>
- Swanson, E.B., (1988), *Information system implementation: Bridging the gap between design and utilisation*, Irwin, Homewood, IL
- Swanson, E.B., (1982), *Measuring user attitudes in MIS research: A review*, Omega, 10, 2, March, pp. 157-165
- Tallon, P., and Kraemer, K., (1999), *The impact of technology on Ireland's economic growth and development: Lessons for developing countries*, Paper read at 32<sup>nd</sup> Hawaii international conference on systems sciences
- Tapscott, Don (1996), *Digital Economy*, McGraw Hill, New York
- Taylor, S., and Todd, P., (1995), *understanding information technology usage: A test of competing models*, Information Systems Research 6 (2), pp. 144-176
- Taylor, P., (1998), *The Future of Enterprise Computing, Network Computing for Business success*, Issue 10, Sun Microsystems.
- Taylor, F.S., (1994), *Business and the Internet*, <http://trinet.com/tonc/inetbusiness.html>
- Teo, T.S.H., Tan, M., and Buk, W.K., (1997), *A Contingency Model of Internet Adoption in Singapore*, IJEC, Volume 2, Number 2, pp. 95
- Tesch, R., (1990), *Qualitative research: Analysis types and software tools*, Farmer, New York
- Thompson, R.L., Higgins, C.A., and Howell, J.M., (1991), *Personal computing: Toward a conceptual model of utilisation*, MIS Quarterly, (15), pp. 125-143
- Timmers, P., (1999), *Electronic commerce: Strategies and models for business-to-business trading*, John Wiley & Sons, Ltd, Chichester, England
- Timmers, P., (1998), *Business models for electronic markets*, International journal of electronic markets, 8 (2), pp. 3-8

- Torasker, K., (1991), *How managerial users evaluate their decision support: a grounded theory approach*, In Nissen, H.E., Klein, H., Hirschheim, R., (eds.), *Information systems research: Contemporary approaches and emergent traditions*, Proceedings of the IFIP WG 8.2 Working Conference, Copenhagen, 14-16 December, North-Holland, Amsterdam
- Tornatzky, L., and Fleischer, M., (1990), *The process of technological innovation*, Lexington books, Lexington, MA
- Tornatzky, L., and Klein, K., (1982), *Innovation Characteristics and innovation adoption-implementation: A Meta-Analysis of findings*, IEEE Transaction Engineering Management, volume EM-29, no.1, pp. 28-45
- Trautha, E.M and O'Connor, B., (1991), *A study of the Interaction between Information Technology and Society: An Illustration of Combined Qualitative Research Methods*, *Information Systems Research: Contemporary Approaches & Emergent Traditions*, H.E.Nissen, H.K. Klein and R. Hirschheim (eds.), Amsterdam, North-Holland.
- Trevino, L. K., Lengel, R.H., Bodensteiner, W., Gerloff, E.A., and Muir, N.K., (1990), *The richness imperative and cognitive style: The role of individual differences in media choice behaviour*, *Management Communication Quarterly*, 4, 2, November, pp. 176-197
- Trevino, L.K., Lengel, R.H., and Daft, R.L., (1987), *Media symbolism, media richness, and media choice in organisation: A symbolic interactionist perspective*, *Communication Research*, volume 14, pp. 553-574
- Turner, B.A., (1983), *The use of grounded theory for the qualitative analysis of organisational behaviour*, *Journal of management studies*, vol. 20, no. 3, pp. 333-348
- Tuunainen, V.K. and Saarinen, T., (1997), *EDI and Internet-EDI: Opportunities of Effective Integration for Small Businesses*, in Galliers, R., Murphy, C., Hansen, H.R., O'Callaghan, R., Carlsson, S., and Loebbecke, C., (Eds.), *Proc. ECIS*, Cork.
- Urquhart, C., (1997), *Exploring Analyst-Client Communication: Using Grounded Theory Techniques to Investigate Interaction in Informal Requirement Gathering*, In A.S.Lee, J.Liebenau, and J.I DeGross (editors), *Proceedings of the IFIP International Conference on Information Systems and Qualitative Research*, Philadelphia, Pennsylvania.
- Vadapalli, A. and Ramamurthy, K., (1997), *Business use of Internet: An Analytical Framework and Exploratory Case Study*, *IJEC*, Volume 2, Number 2, pp. 71
- Van der Heijden, H., (2000), *The impact of perceived website characteristics on web traffic*, 13<sup>th</sup> International Bled Electronic conference, Bled, Slovenia

- Vassilopoulou, K., Keeling, K., Macaulay, L.A., and McGoldrick, P., (2000), *identifying a usability evaluation technique by following an SME centred approach*, 13<sup>th</sup> International Bled Electronic conference, Bled, Slovenia
- Venkatraman, N., (1994), *IT-enabled business transformation: From automation to business scope redefinition*, Sloan management review, December, pp. 73-87
- Vitalari, N.P., (1985), *The need for longitudinal designs in the study of computing Environments*, in research methods in information systems, E.Mumford et al (eds.), Elsevier science publishers, 243-263, North-Holland
- Walsham, G., (1995), *Interpretive case studies in IS research: Nature and Method*, European Journal of Information Systems, pp. 74-81
- Walsham, G., (1993), *Interpreting Information Systems in Organisation*, John Wiley & Sons Ltd, Chichester, England.
- Watson, H., (1993), *Interpreting Information Systems Development Methodology: An historical textual analysis of concepts in inquiry*, Research proposal, University of Salford.
- Webster, F., (1995), *Theories of the information society*, Routledge, London
- Weick, K.E. (1984), *Theoretical assumptions and research methodology selection*, In the information systems research challenge, McFarlan, F.W. (ed.), Harvard business school press, Boston
- Weill, P and Olson, M.H. (1989), *An assessment of the contingency theory of management information systems*, Journal of management information systems, 6, pp. 59-86
- Weisband, S.P., Schneider, S.K., and Conolly, T., (1995), *Computer-mediated communication and social information: Status salience and status differences*, Academy of management journal, vol. 38, no. 4, pp. 1124-1151
- Welsh, D.H.B., and Cummings, L.L., (1991), *Applying computer technology for the 1990s and beyond*, <http://161.31.2.174/docs/proceedings/93sbi042.txt>
- Wester, G., and Franco, S., (1995), *The Internet shakeout 1996*, Interactive commerce research bulletin, the Yankee group, Boston
- Whiteley, A (1995), *Managing Change: A Core Value Approach*, Macmillan Education Pty Ltd.
- Wigand, R.T., (1997), *Electronic commerce: Definition, theory and context*, The information society, 13 (1), pp. 1-16
- Wilkins, L., Swatman, P.M.C., and Castleman, T., (2000), *Electronic Commerce as Innovation - Framework for Interpretive Analysis*, 13<sup>th</sup> International Bled Electronic conference, Bled, Slovenia



- Willcocks, L.P., and Lester, S., (1999), *Information technology: Transformer or sinkhole*. In Willcocks, L.P., and Lester, S., (eds.), *Beyond the IT productivity paradox*, Wiley.
- Winston, B., (1998), *Media, technology and society*, Routledge, London
- Wolcott, H., (1990), *Writing up qualitative research*, Sage publications, Newbury park, CA
- Wolfe, R.A., (1994), *Organisational innovation: Review, critique and suggested research directions*, *Journal of management studies*, 31, 3, pp. 405-431
- Woolgar, S., (1998), *A new theory of innovation*, *Prometheus*, 16 (4), pp. 441-452
- Wyckoff, A., and Colecchia, A., (1999), *The economic and social impacts of electronic commerce*, OECD,  
[http://www.oecd.org/publications/pol\\_brief/9701\\_pol.html](http://www.oecd.org/publications/pol_brief/9701_pol.html)
- Wynekoop, J.L., (1992), *Strategies for Implementation Research: Combing Research Methods*, In J.I.DeGross, J.D.Becker, and J.J.Elam (editors), *Proceeding of the Thirteenth Annual International Conference on Information Systems*, Dallas, Texas
- Yates, J. and Orlikowski, W., (1992), *Genres of Organisational Communication: A Structural Approach to Studying Communication and Media*, *Academy of Management Review*, 17, 2, pp. 299-326.
- Yap, C.S., Soh, C.P.P., and Raman, K.S., (1992), *Information systems success factors*, In *small business international journal of management science*, vol. 20, pp 597-6
- Yetton, P., Johnston, K., and Craig, J., (1994), *Computer-aided Architects: A case study of IT and strategic change*, *Sloan Management Review*, summer
- Yetton, P., Sharma, R., and Southon, G., (1997), *Successful IS Innovation: The Contingent contributions of Innovation Characteristics and Implementation Process*,
- Yin, R. K., (1994), *Case Study Research, Design and Methods*, Sage Publications, Newbury Park.
- Yin, R.K., (1984), *Case Study Research: Design and Methods*, Sage publications, Beverly Hills.
- Zmud, R.W., Boynton, A.C., and Jacobs, G.C., (1989), *An Examination of Managerial Strategies for Increasing Information Technology Penetration in Organisations*, in J.I.DeGross, J.C.Henderson, and B.R. Konsynski (eds.), *Proceedings of the Ninth International Conference on Information Systems*, Boston, Massachusetts, pp. 24-44
- Zmud, R. W., (1995), *Editor's Comments*, *MIS Quarterly*, 19, 1, pp. v-viii.

Zmud, R.W., (1984), *An examination of push-pull theory applied to process innovation in knowledge work*, Management Science, vol. 30, no. 6, pp. 727-738

Zuboff, S., (1988), *In the age of smart machine*, basic books, New York.

Zwass, V., (1996), *Electronic Commerce: Structures and Issues*, IJEC, Volume 1, no. 1, pp. 3 – 23

## **APENDICES**

## Appendix 1: Sample Cover Letter for Questionnaire

Postgraduate Suite  
Information Systems Research Centre  
Information Systems Institute  
University of Salford  
Salford M5 4WT

Dear Sir/Madam

We are conducting a survey about the use of the Internet in small to medium-sized enterprises (SMEs). This survey is being carried out to try to discover how SMEs use the Internet and the impact of using it in their business operations. The purpose of the study is to explore the use of the Internet in small to medium-sized companies in the UK. The study aims to explore the importance of the use of the Internet within the workplace, the benefits of using the Internet, as well as the issues hindering its use.

We have enclosed a copy of our questionnaire, which will take you just a few minutes to complete. We appreciate the significant pressure that you currently work under but it would be extremely helpful to our research, if you would take the time to complete the questionnaire and return it to us in the enclosed self-addressed envelope. The information you provide will contribute to an important part of our research which will help us to understand how companies such as yours use the Internet in business operations.

All the information provided will be kept in the strictest confidence and will not be revealed to any outside sources. We would very much welcome your comments on any aspect of the questionnaire, or any other points you may wish to raise. Space has been provided at the end of the questionnaire for this purpose.

We appreciate your willingness to help us in our research effort. If you would like a copy of the summary of the results please indicate this on the last page of the questionnaire. Thank you for your time and patience in completing this questionnaire, it has been much appreciated.

Yours Sincerely,

J Lawrence  
*Research Student*  
Telephone: 0161 295 4431  
Email: [j.lawrence1@pgr.salford.ac.uk](mailto:j.lawrence1@pgr.salford.ac.uk)

## Appendix 2: Sample follow-up Letter for Questionnaire

Postgraduate Suite  
Information Systems Research Centre  
Information Systems Institute  
University of Salford  
Salford M5 4WT

Dear Sir/Madam

We are conducting a survey about the use of the Internet in small to medium-sized enterprises (SMEs). This survey is being carried out to try to discover how SMEs use the Internet and the impact of using it in their business operations. The purpose of the study is to explore the use of the Internet in small to medium-sized companies in the UK. The study aims to explore the importance of the use of the Internet within the workplace, the benefits of using the Internet, as well as the issues hindering its use.

We mailed you one of our questionnaires recently and asked if you could please complete and return it back to us in the enclosed self-addressed envelope. Unfortunately we do not appear to have received a reply from you.

We have enclosed a second copy of the questionnaire, which will take you just a few minutes to complete. We appreciate the significant pressure that you currently work under but it would be extremely helpful to our research, if you would be kind enough to take the time to complete this new questionnaire and return it to us as soon as possible using the enclosed reply-paid envelope. The information you provide will contribute to an important part of our research which will help us to understand how companies such as yours use the Internet in business operations.

We are just as anxious to have the replies of companies that do or do not use the Internet within their business. We promise that the information that you will provide will remain absolutely confidential. Your name will not be revealed or associated with your response nor will anyone outside of the research team be allowed to see your response.

We appreciate your willingness to help us in our research effort. If you would like a copy of the summary of the results please indicate this on the last page of the questionnaire. Thank you for your time and patience in completing this questionnaire, it has been much appreciated.

Yours Sincerely

J Lawrence  
Telephone: 0161 295 4431  
Email: [j.lawrence1@pgr.salford.ac.uk](mailto:j.lawrence1@pgr.salford.ac.uk) or [lawrenceje@yahoo.com](mailto:lawrenceje@yahoo.com)

## Appendix 3: Survey questionnaire

Room G11h  
Postgraduate Suite  
Information Systems Research Centre  
Information Systems Institute  
University of Salford  
Salford M5 4WT

**Instructions:** For each of the following questions please tick the answer that comes closest to the way you feel about the use of the Internet in your company. There are no 'right' or 'wrong' answers. Please answer the questions as honestly as possible. If you wish to make additional comments on any of the specific questions or on any issues in general, use the space at the end of the questionnaire. Your opinions are extremely important for understanding how companies such as yours use the Internet. We greatly appreciate your co-operation

### SECTION 1 USE OF THE INTERNET

This section looks at the ways in which companies use the Internet. Uses include dealing with customers and suppliers and internal company use. The following questions ask about the use of the Internet in your company.

#### G (1) Does your company use the Internet?

Yes  No *Go to question G (12) then go to section 5 company background*

#### G (2) Do you have a web site on the Internet?

Yes  No

#### G (3) Which of the following Internet resources does your company use?

*(Please tick all that apply)*

- |   |   |
|---|---|
| <input type="checkbox"/> Electronic mail (e-mail) | <input type="checkbox"/> File transfer protocol (Ftp) |
| <input type="checkbox"/> Gopher                   | <input type="checkbox"/> Telnet (for remote access)   |
| <input type="checkbox"/> World-wide web (WWW)     | <input type="checkbox"/> Search engines (e.g. yahoo)  |
| <input type="checkbox"/> Voice/Video conferencing | <input type="checkbox"/> Usenet News (Newsgroup)      |

Other (specify): \_\_\_\_\_

#### G (4) What do you use the Internet for?

*(Please tick all that apply)*

- Advertising
- Customer service
- Resources sharing
- Information gathering
- Administrative support
- Human resources/Personnel
- Business and strategic planning
- To gain competitive advantage
- Video conferencing via the Internet
- Research/Development/Design and production
- Information gathering (getting information from suppliers)
- Market and product research (including feedback from customers)
- Transaction (send orders to suppliers, receive orders from customers)
- Communication (within and external communication with other companies including e-mail)
- Information distribution and dissemination (providing customers information)

Other (specify): \_\_\_\_\_

#### G (5) How important is Internet to your company's competitiveness

- Essential  Very important  
 Quite important  Not very important  Not at all important

The following questions ask about the use of the Internet in marketing and advertising

**G (6) Does your company advertise its products or services on the Internet?**

Yes             No    *Go to question G (9)*

**G (7) How important is your company's web site for advertising/marketing purposes**

Essential             Very important  
 Quite important     Not very important     Not at all important

**G (8) How effective has the Internet been in the marketing & advertising of your company's products or services?**

*(a) Increased in product sales*

Very effective     Effective     Neutral     Ineffective     Very ineffective

*(b) Increased in profit*

Very effective     Effective     Neutral     Ineffective     Very ineffective

*Please go to question G (10)*

**G (9) why don't you advertise on the Internet?**

*(Please tick all that apply)*

- Technical limitations of hardware/software (e.g. slow connection, text only software)
  - Lack of expertise or personnel
  - Target customers not connected to the Internet
  - Do not believe that the Internet is effective for advertising
  - Connection and /or usage charges too expensive
  - No company policy on Internet use in place
- Other (specify): \_\_\_\_\_

**G (10) Which of the following statements do you (1 strongly agree to, 2 agree with, 3 neutral, 4 disagree with, or 5 strongly disagree with) think represent your views on the use of the Internet**

*(a) Small to medium-sized companies is aware of the benefits they can achieve through the use of the Internet and its technologies (e.g. web, email, etc)*

Strongly agree  Agree  Neutral  Disagree  Strongly disagree

*(b) Security of Internet is a key concern for business transaction*

Strongly agree  Agree  Neutral  Disagree  Strongly disagree

*(c) Foreign competition for small to medium-sized companies traditional market will increase*

Strongly agree  Agree  Neutral  Disagree  Strongly disagree

*(d) The use of Internet will allow companies to gain access to a wider variety of potential customers*

Strongly agree  Agree  Neutral  Disagree  Strongly disagree

*(e) There will be a lot of potential business opportunities for companies in overseas market*

Strongly agree  Agree  Neutral  Disagree  Strongly disagree

*(f) Internal Company communication and co-ordination will improve as a result of Internet use*

Strongly agree  Agree  Neutral  Disagree  Strongly disagree

*(g) Inter-business collaboration between small to medium-sized companies will increase*

Strongly agree  Agree  Neutral  Disagree  Strongly disagree

*(h) Internet helps company to differentiate itself from other companies through product innovation, creation of new products or customising existing products in an innovative ways*

Strongly agree  Agree  Neutral  Disagree  Strongly disagree

Internet allows easier entry into traditionally hard access markets, due to less expensive product motion, and new sales channel

Strongly agree  Agree  Neutral  Disagree  Strongly disagree

**(11) Overall, how effective has the Internet been in meeting your company's needs?**

i) In terms of marketing advertising your products or services

Very effective  Effective  Neutral  Ineffective  Very ineffective

b) In terms of communication (e.g. using email within and outside your company)

Very effective  Effective  Neutral  Ineffective  Very ineffective

c) In terms of competition (e.g. gained competitive advantage over your competitors)

Very effective  Effective  Neutral  Ineffective  Very ineffective

Please go to section 2 Internet benefits

**G (12) What is your reason for not using Internet?**

(Please tick all that apply)

- |  |   |
|--|---|
| <input type="checkbox"/> You believe Internet is expensive to use        | <input type="checkbox"/> You are concerned about security             |
| <input type="checkbox"/> You are currently in the process of connecting  | <input type="checkbox"/> You have no reason to connect to Internet    |
| <input type="checkbox"/> You don't believe Internet is reliable & secure | <input type="checkbox"/> You don't understand the Internet technology |
| <input type="checkbox"/> Customers not connected to the Internet         |   |

Other (specify): \_\_\_\_\_

Please go to section 5 Company background

**SECTION 2 INTERNET BENEFITS**

This sections asks about the benefits of using Internet

**B (1) Which of the following benefits has the company gained from the use of the Internet?**

(Please tick all that apply)

- |  |  |
|--|--|
| <input type="checkbox"/> Improved information gathering                                    | <input type="checkbox"/> Better service and support from suppliers     |
| <input type="checkbox"/> Greater customer satisfaction                                     | <input type="checkbox"/> Ability to reach out to international markets |
| <input type="checkbox"/> Creation of new markets   | <input type="checkbox"/> Easier entry into new market                  |
| <input type="checkbox"/> Increased productivity  | <input type="checkbox"/> Better awareness of business environment      |
| <input type="checkbox"/> Improved communications   | <input type="checkbox"/> Faster, more flexible delivery from suppliers |
| <input type="checkbox"/> Increase in market share of your products or services             |  |
| <input type="checkbox"/> Availability of expertise regardless of physical location         |  |
| <input type="checkbox"/> Lower cost (including obtaining supplies, operational costs, etc) |  |

Other (specify): \_\_\_\_\_

**SECTION 3 INTERNET ISSUES**

This section asks about the issues hindering the use of the Internet

**P (1) For each of the issues listed below, please tick how important they are to your company**

(a) Whether the person you are communicating with is who they claim to be

Very important  Important  Not important

(b) Interception of network messages by unintended parties

Very important  Important  Not important

(c) Whether there is guarantee of message delivery to the intended party

Very important  Important  Not important

(d) Tampering with network messages

Very important  Important  Not important



(e) Whether contract negotiations made via the Internet are enforceable

Very important       Important       Not important

(f) Whether external user can gain unauthorised access to your internal network

Very important       Important       Not important

(g) Whether system is reliable (e.g. available when you need it)

Very important       Important       Not important

(h) Whether the privacy of information is guaranteed

Very important       Important       Not important

(i) Lack of universal electronic payment systems

Very important       Important       Not important

(j) Lack of copyright protection over the network

Very important       Important       Not important

(k) Concern on how to tax and collect taxes over the network

Very important       Important       Not important

#### **SECTION 4 COMPANY BACKGROUND**

The questions asked in this section will be used purely for classification purposes only. The information gathered will not be used in any other way and will be kept strictly confidential

**C (1) Name of responding company:** \_\_\_\_\_

**C (2) what is your role in the company?**

Owner                       Manager                       Director  
 Partner                       Business analyst               IT/MIS/Computer services/manager  
 Technical support               Managing director

Other (specify): \_\_\_\_\_

**C (3) Please tick one of the following regarding the main business activity of your company**

Construction               Manufacturing               Telecommunications  
 Wholesale                   Health/medical               Transport/Storage  
 Financial services               Retail                           Mining/Quarrying  
 Hospitality/Restaurant       Service industries               Agriculture/Forestry/Fishing  
 Utilities (Electricity/Gas/Water)       Community/Social/Personal services

Other (specify): \_\_\_\_\_

**C (4) What is the estimated number of employees in your company?**

1-9                               10-49                               50-99  
 100-149                               150-199                               200-250

**C (5) What is the estimated annual turnover of your company?**

Less than £50,000       £50,000 - £100,000       £100,000 - £500,000  
 £500,000 - £1000,000       £1000,000 - £5000,000       Greater than £5000,000

**Please make any comments on specific questions or any issues in general**

Comments: \_\_\_\_\_

The following information is not obligatory. If you will be willing to spend some of your valuable time, I would like to conduct a short follow up interview regarding your company. The interview will last less than an hour. I would appreciate it if you could leave contact details below.

Contact person's name: \_\_\_\_\_

Contact telephone number: \_\_\_\_\_

Email address (if applicable): \_\_\_\_\_

Thank you for your time and patience in completing this questionnaire, it has been much appreciated. A summary of results will be mailed or emailed to all participants once the data is analysed.

J Lawrence  
Postgraduate Suite  
Information Systems Institute  
University of Salford  
Salford M5 4WT

*Telephone: 0161 295 4431*

*Email: [j.lawrence1@pgr.salford.ac.uk](mailto:j.lawrence1@pgr.salford.ac.uk) or [lawrenceje@yahoo.com](mailto:lawrenceje@yahoo.com)*

#### **Appendix 4: Sample Request letter for Interview**

Information Systems Research Centre  
Information Systems Institute  
University of Salford  
Salford M5 4WT

Dear Mr/ Ms X

#### **Re: The Use of Internet in Small to Medium-sized Enterprises (SMEs)**

Thank you very much for participating in our 1999 interview. As part of our research project currently underway to understand the factors that influence Small to Medium-sized Enterprises (SMEs) to use the Internet in business. I have been asked by the project supervisors to conduct a second interview to compare the changes if any, since the last time I interviewed you, regarding the use of the Internet in your organisation. To this end, I would like to visit your company in the near future to carry out a short interview with you in order to help us better understand the factors that influence SMEs decision to adopt and use the Internet in business

I appreciate the significant pressures that you currently work under but it would be extremely useful to our research, if you would be willing to give half an hour of your time to discuss these issues with me. You will find attached a list of possible dates for these interviews to take place. I would be very grateful if you could indicate when you will be available (with a number of alternatives if at all possible) and return this to me as soon as it is convenient for you to do so, using the enclosed reply-paid envelope.

Thank you in advance for your help in this matter and I look forward to meeting you again in the near future.

Yours sincerely,

J Lawrence  
Tel: 07719357382 or 02076091019  
Email: [lawrenceje@yahoo.com](mailto:lawrenceje@yahoo.com) or [j.lawrence1@pgr.salford.ac.uk](mailto:j.lawrence1@pgr.salford.ac.uk)

Research project supervisors:  
Professor A. T. Wood-Harper & Dr. J. Hughes  
Information Systems Research Centre  
Tel: 0161 295 4076  
Email: [j.hughes@salford.ac.uk](mailto:j.hughes@salford.ac.uk)

### Appendix 5: Sample availability form for interview

Mr /Ms X  
 Company Name  
 Address  
 City  
 Post code

Please indicate your availability below: -

Date	9-10am	10-11am	11-12am	12-1pm	1-2pm	2-3pm	3-4pm	4-5pm
Monday 16 <sup>th</sup> July								
Tuesday 17 <sup>th</sup> July								
Wednesday 18 <sup>th</sup> July								
Thursday 19 <sup>th</sup> July								
Friday 20 <sup>th</sup> July								
Monday 23 <sup>rd</sup> July								
Tuesday 24 <sup>th</sup> July								
Wednesday 25 <sup>th</sup> July								
Thursday 26 <sup>th</sup> July								
Friday 27 <sup>th</sup> July								
Monday 6 <sup>th</sup> August								
Tuesday 7 <sup>th</sup> August								
Wednesday 8 <sup>th</sup> August								
Thursday 9 <sup>th</sup> August								
Friday 10 <sup>th</sup> August								
Monday 13 <sup>th</sup> August								
Tuesday 14 <sup>th</sup> August								
Wednesday 15 <sup>th</sup> August								
Thursday 16 <sup>th</sup> August								
Friday 17 <sup>th</sup> August								

Availability form 16<sup>th</sup> July to 17<sup>th</sup> August 2001

## Appendix 6: Sample Interview guide

### ***Organisational Background***

- Business name, role in the company, type of business, size (no employees), established,
- Organisation estimated annual turnover
- Business strategy
- Organisational objectives

### ***Organisational IT experience (technology context)***

- What IT does your organisation have in place
- Number of computers

### ***Use of the Internet***

- Reasons for using the Internet
- What do you use the Internet for
- Internet to advertise products/services
- How important is the Internet for advertising products/services
- Can you describe how your organisation has benefited from the use of the Internet or why your company had not benefited from the use of the Internet
- What are the factors that influence you to adopt and use the Internet in your organisation?
- What are the main barriers hindering the adoption and use of the Internet in business
- Last time when I interviewed you, your company was not using the Internet, so what is the situation now?
- What has changed since the last time I interviewed you regarding the use of the Internet in your organisation?

### ***Not advertising on the Internet***

- Can you tell me why your company is not using the Internet to advertise their products/services?
- Have you considered the benefits of using the Internet to advertise your products/services?

### ***Not using the Internet***

- Can you tell me why your company is not using the Internet?
- Have you considered the benefits of using the Internet to your company?

## Appendix 7: Sample extracts from [AL] and [BIL] transcripts

### Sample extracts from [AL]

#### *Technological factors*

*Benefits of using the Internet: [Communication medium to improve organisational efficiency]* We started to use the Internet largely to improve our internal operations through improved communication. The Internet gives us an improved easy channel of communication to our customers, and it offers and gives us a means of being recognised and the ability to globally reach potential customers. Having an email is as necessary as the need for a fax number. It is difficult to quantify how much business the fax service can bring in, but it is essential to have a fax machine.

*[Promotional and advertising]* The Internet offers us the opportunity for new promotion strategies, enhancing the branding of our products and also its use has made us aware of our competitors and markets in general. We use the Internet for marketing and we consider our web site as very important major part of our publicity. We treat our web site as an important platform to provide information about our company and advertise our products and services to the global audience. The web offers us the opportunity for our customers to interactively communicate to us directly through our web site. It offers us the opportunity to compete in a global market by offering low operating costs and the ability to do business round the clock and the chance to foster better customer relationships.

*[Better customer service]* The interactive capability of the Internet enables us to provide better customer service and also to tap on our existing and prospective customers for ideas to differentiate our products and services. Customers could easily browse through our catalogue and get information about our products and services at any time through our web site, instead of phoning and also they could easily email enquires to our help-desk.

*[The Internet generates new business opportunities]* The use of the Internet for marketing has been very effective; it has certainly helped increase sales inquiries, generate sales and maintains business. We have generally seen a slight increase in sales and we have done more business because of Internet use and would certainly lose more business without it. It is too soon to tell if the overall profitability has increased, however, the sales we have generated from being on the Internet have all been mainly outside our area and would not have occurred otherwise.

*[Global markets reach]* The global reach of the Internet has given us the opportunity to provide information about the company and to advertise and sell our products and services to global audience. The relationship with our customers has changed because of the use of the Internet; our customers can get information about our products and services at any time through our web site, instead of phoning to get information from us.

*[Easy access to global information]* The use of Internet has had a considerable impact on our marketing activities in the areas of searching and gathering information and in exposing our company globally, which means other people or companies can gain

information about us. The most useful impact of using the Internet is the easy access of Information. We use the Internet to search for customer information and for obtaining specific information for marketing purposes. The amount of information that we can get, about things useful to our business is endless. We can find and gather information more easily about our competitors and customers, for example, we have connections with the board of trade, dept of trade and industry, that gives us information relevant to our business from all over the world.

*Cost-effectiveness:* The Internet provides a relatively low-cost alternative to advertise globally and also to find suitable business partners and suppliers around the world. The use of the Internet enables us to place brochure, catalogue, corporate information, and support material on-line for a fraction of the cost of print counterparts. It provides us with the cheapest form of advertisement relative to the number of people that we can reach. A small company with a suitable product or service to sell can create as much of an impact in its own domain as a large business with a much larger budget.

*Compatibility:* We believe that the use of the Internet can introduce changes to our business processes such as sales and customer-supplier relationships. The use of the Internet is compatible with our objectives of reducing communication costs and improving efficiency. The main reason for using the Internet is to improve efficiency and reduce operational costs such as advertising, communication and information access. The use of the Internet enables us to co-ordinate and work more efficiently and also its use within the organisation is to support our marketing activities.

*Perceived richness of the Internet:* The Internet enables free information exchange and the ability to perform a variety of activities such as easy access to global information and to reach out to customers around the globe.

*Perceived usefulness of the Internet:* We see the Internet as a useful interactive communications tool that enable us to easily communicate with our existing and potential customers, and our network of agents through email. It provides information about products and it is an important way for our customers to get information from us through our web site and email. It is a useful tool for market research to find out about the movement and trends in business marketplace, the actions of business competitors and partners, resources of value to the efficient operation of business. We see it as a very useful market research tool to access a variety of information from all over the world.

### ***Environmental factors***

*Competitive pressure:* The main reasons that encouraged us to start using the Internet is because almost every other company in the world is using it. We are interested in both growing our existing business (increasing market share) and streamlining our operations by cutting costs and redesigning business processes. We are always seeking ways of adding values on a set of our products and we see the Internet as another way of gaining competitive advantage by adding value to our company and differentiating ourselves from our competitors through constantly innovating our products and services. Using the Internet to gain competitive advantage thus became a general corporate strategy.

### ***Organisational factors***

*Management Support:* The managers here frequently use the Internet in their work, for e.g. to send memos to the staff. The Internet not only allows us to more easily share information within the company, but it allows every employee to have access to an unbelievable amount of information from a variety of other sources.

### ***Barriers to Internet adoption***

*Security:* We could not send confidential document over the Internet because of legal and privacy concerns. We recognise security as a major issue, and in certain respects it is an obstacle to using the Internet for certain transactions. We have to maintain commercial confidentiality, and secrecy, over some of our specifications, until we are happy with the level of security offered. We might not be happy to send specifications of our machines over the Internet with the present level of security, we would not want our competitors to know the necessary details that they could copy it.

### **Sample extracts from [BIL]**

#### ***Technological factors***

*Benefits of using the Internet: [Promotional and advertising]* We currently use it to advertise our used cars. From the company's point of view, it's another valid means of advertising goods and service to a global audience. It's certainly valid as an advertising medium just like radios and newspapers, and its use is increasing everyday. It is just another form of projecting information, goods and services to the consumer no different to television, radio, and newspapers. It's another means of letting people know, what we got, I suppose we could use ceefax, if the truth be known. I can't conceive that we would want to extend its use any further than communication and advertisement. It enables us to provide information to a wider audience about our cars and services. The Internet bridges the mile gap, which is very useful to business. The Internet enables anybody, from a wide area, to find out what your goods are and what services you are offering.

*[Communication medium to improve organisational efficiency]* We see the Internet as a medium of communication and it's a very easy one, to lower cost as far as we are concerned, it's just like the ceefax on television, which for years we never ever used. Email is just a method of communicating with people, we see it as a thing, which connects us with our customers or business associates. It is a quick and easy way to communicate to customers on a global basis with the same ease that larger organisations communicate internally using their internal local area networks. Although most of the communications we do now are by phone and fax, occasionally, we use the Internet to communicate to our customers through email, although it is not part of our culture. If you're saying will e-mail be part of the culture of the company, it is going to have to come very quickly, because we're all in a business where you've got to keep cutting costs and we see email as a quick and easy way to communicate to our customers at a very low cost. It is a medium of communication, I wouldn't see it particularly changing, in other words its straightforward advertising.

*[The Internet generates new business opportunities]* The Internet is mainly another selling tool to provide information and advertise products to the global audience. It is a good medium to sell new cars but a less attractive medium for used cars. Having said that, we've had a few enquiries of the Internet, and we sold a vehicle as a result.



We are starting to get a bit of business of the Internet and its use is increasing rapidly. Its use has made us aware of our competitors and markets in general, and it is also a very useful research tool to search and gather information that is useful to our business. It gives us easy access to information and communication to our customers. We use it as a means to establish our company in the global market and publicise our vehicles, we certainly think it's a useful business tool for communication and advertising products and services to the international markets.

*[Easy entry into new markets]* The Internet allows easier entry into new market, especially geographically remote markets, as the playing field become more level between companies of different sizes and budget, thereby giving small business like us the opportunity to compete with larger companies on the same playing field.

*Cost-effectiveness:* The lower operational costs of advertising and communicating to customers are very attractive to us, especially since we do not have the resources of the big companies to advertise our products in traditional way. It offers us the opportunity to mount aggressive advertisement just as the big companies.

*Compatibility:* We believe its use levels the playing field, giving companies like ours the opportunity to advertise to a global market and compete with larger companies. Advertising in the paper, in London, no idea what BIL look like, we could be operating out of this office, but as long as the web site looked professional enough, people will not know how small or big the firm is. We see the Internet as being compatible with our culture of cutting costs. We see the Internet as a medium of communication and a very easy one, to lower cost as far as we are concerned and as another form of projecting information, goods and services to the global audience no different to television, radio, and newspapers.

*Perceived usefulness of the Internet:* We see the Internet as a means to establish the company and publicise our vehicles, we certainly think it's a useful business tool for communication and advertising products and services to the international markets. It is a good medium to sell new cars but a less attractive medium for used cars. We also use it as a research tool to find out what our competitors are doing.

*Perceived richness of the Internet:* We see the Internet as a rich business tool, we think that business will grow on it.

*Perceived ease of use of the Internet:* It is a quick and easy way to communicate to customers on a global basis with the same ease that larger organisations communicate internally using their internal local area networks. The Internet is easy to use particularly the email and searching for information.

*Complexity:* We feel the Internet technology is too complex and not well understood without enlisting the help of an expert and its use may increase the complexity of our business rather than facilitate positive change. This is why we needed guidance on how we can benefit from its use in business. As you know being a small business, we do not have the skills, the understanding or the resources to investigate the many alternatives for using the Internet or trading with business partners. The use of the Internet for advertising and communication purpose is relatively simple and straightforward, however, extending its coverage to direct sales and integrating it to

our internal information system introduces extra handling involving a variety of hardware and software. We also think the lack of ownership makes the Internet a complex technology to manage and its use presents a significantly open and flexible environment that is vulnerable to misuse, not least the hackers, viruses and unauthorised access.

### ***Environmental factors***

*External pressure:* The use of the Internet is not really a pressing need for us, we started using the Internet because it is part of the franchise package from Peugeot and we were asked to use it. There is a fairly close relationship between the manufacturers and the dealers, they have come up with this package on the Internet and persuaded the dealers to go on board, that is why we are on it. There is not that feeling that we are missing out or that we have lost a lot of business by not being on it fully. However, we think that increasingly business will be done on it, and we want to join the bandwagon and be part of it.

### ***Barriers to Internet adoption***

*Lack of Internet knowledge:* We do not use the Internet or exploit it as fully as we could, because we haven't got the expertise within the company that understands how the Internet works. Probably one or two play about on it, but how they set it up is why we needed guidance.

*Limitation of personal contact:* The use of the Internet for communication does lose the relationship with people, we are a bit concerned about the reduction in personal involvement with customers, you can't replace going to see people, you can't beat having face-to-face interaction for selling products. Typing (email) into the computer was not the same as speaking face to face with someone.

*Uncertainty about the Internet:* As you can see we are a small business, we are not totally convinced about the value of using Internet or nobody has convinced us that the Internet is the answer to every business problem. We need to be convinced about the potential of using the Internet in business. Over the years we have seen many things that are supposed to do this, that, and the other and you got involved and it does not work out the way you have been told. I think the hype of the Internet is way ahead of the reality.

## Appendix 8: How grounded theory was applied to the case study?

Analysing data is both the most difficult and the least codified part of the research process (Eisenhardt, 1989). Coding in qualitative research involves segmenting the data into units (Hammersley and Atkinson, 1993) and rearranging them into categories that facilitates insight, comparison, and the development of theory (Strauss and Corbin, 1990). Codes served as retrieval and organising devices that allowed the rapid retrieval, and clustering of all the segments related to a particular question, concept or theme. The data were analysed within each case as well as across the seven cases to detect similarities and compare differences. Within the first case, the iterative approach of data collection, coding, and analysis was more open-ended, and generative, focusing on the development of concepts, properties, and relations, and following the descriptions of how to generate grounded theory set out by Glaser and Strauss (1967) and Eisenhardt (1989).

The detailed write-up of the cases and all the data generated by interviews, and documentation were examined and coded by focusing on the factors that influence adoption and use of the Internet in business. This technique uses open coding (Strauss and Corbin, 1990) where the data are read and categorised into concepts that are suggested by the data rather than imposed from outside (Orlikowski, 1993). This was essentially a line by line examination of the data to generate concepts or codes. Open coding quickly forced the researcher to break apart and fractured the data analytically, leading to grounded conceptualisation (Strauss, 1987). This process relied on an analytic technique of identifying possible codes, clustering or grouping categories of data together according to the codes and their properties and dimensions (see appendix 7 for extracts of the sample coding of the transcripts). Miles and Huberman, (1994) recommend that codes should relate to one another in coherent, study-important ways and provide a governing structure for the analysis.

For example some of the initial codes that emerged from the open coding process were *promotional and advertising, communication medium to improve organisational efficiency, easy entry into new markets, and the Internet generates new business opportunities*. All these codes contributed to the category 'benefits of using the Internet'. Once all the data were examined, the codes were organised by recurring theme, for example benefits of using the Internet, cost effectiveness, compatibility and perceived usefulness. These themes became prime candidates for a set of stable and common categories, which linked a number of associated codes. This is known as axial coding (Strauss and Corbin, 1990) and it relies on a synthetic technique of making connections between subcategories to core categories to construct a more comprehensive scheme. For example the categories of benefits of using the Internet, cost effectiveness, compatibility and perceived usefulness became subcategories of the technological (Internet characteristics)

The first SME case data were then re-examined and re-coded using this proposed scheme, the goal being to determine that set of categories and concepts covered as much of the data as possible. This iterative examination yielded a set of broad categories and associated concepts that described the salient conditions, events, experiences, and consequences associated with the adoption and use of the Internet in the first SME case, see table A.1.

Table A.1 sample of the initial concepts that emerged from the analysis of the first SME case

Emergent Core category	Subcategory	Codes
Technological	<i>Benefits of using the Internet</i>	<i>Global markets reach, communication medium to improve organisational efficiency, promotional and advertising, better customer service, easy access to global information, the Internet generates new business opportunities</i>

These initial concepts guided the remaining field study, allowing the process of data collection, coding, and analysis to be more targeted. Following the constant comparative analysis method (Glaser and Strauss, 1967), the remaining SMEs case's experiences were systematically compared and contrasted with those of the initial SME case. This analysis also used Miles and Huberman's (1984) technique for across-case pattern comparison and clustering that involves matrix displays to compare key events, triggers, and outcomes, see table A.2 for across case comparison.

Table A.2 across case pattern comparison

Core categories	Subcategories	Small to medium-sized enterprises						
		AL	SAH	BIL	BPC	FP	MGL	CLR
Technological	<i>Compatibility</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	<i>Cost effectiveness</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	<i>Benefits of using the Internet</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	<i>Perceived usefulness of the Internet</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	<i>Perceived richness of the Internet</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	<i>Perceived ease of use of the Internet</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Organisational	<i>Management support</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	<i>Organisational resources</i>	Yes	Yes	Yes	Yes	Yes		Yes
	<i>Organisational size</i>						Yes	
Environmental	<i>Competitive pressure</i>	Yes			Yes	Yes	Yes	Yes
	<i>External pressure</i>			Yes	Yes		Yes	
Inhibiting	<i>Security</i>	Yes	Yes				Yes	
	<i>Lack of Internet knowledge</i>		Yes	Yes			Yes	
	<i>Cost of investment</i>		Yes				Yes	
	<i>Complexity</i>			Yes				
	<i>Limitation of infrastructure</i>					Yes		Yes
	<i>Uncertainty about the Internet</i>			Yes	Yes			
	<i>Limitation of personal contact</i>			Yes				Yes
<i>Lack of universal electronic payment systems</i>							Yes	

Source: (Case study data)

The iteration between data and concepts ended when enough categories and associated concepts had been defined to explain the factors that influence SMEs decision to adopt and use the Internet in business, and when no additional data were being collected from the SMEs to develop or add to the set of concepts and categories, a situation Glaser and Strauss (1967) refer to as "theoretical saturation." The resultant theoretical model is empirically valid as it can account for the unique data of each case in the study, as well as generalise patterns across the cases (Eisenhardt, 1989). The participants in the study provided commentary, correction, and elaboration on drafts of the findings and theoretical model. The concepts and categories that emerged from the case analysis were used to develop the theoretical model shown in figure 6.1.

## **Appendix 9: Background summary of SMEs that participated in this study**

The section presents a brief background summary of each of the SMEs used in this study. For each SME a brief history and IT usage within the business is given.

### *MGL*

MGL carpet finishers' Ltd manufacturers of contract carpets for the health care and contract tiles for offices, ships and hotels. MGL is a small company that was established in 1972 and employs about 9 people with an estimated annual turnover of 1.7 million pounds. MGL has 4 PCs that are used mainly for administrative purposes such as word-processing, spreadsheet and basic accounting. The company currently uses the Internet in their business.

### *BIL*

BIL is a Peugeot franchise holder that deals in new and used cars, servicing and selling spare parts. BIL has been around since 1932 and was well established in their local market. BIL is a small business employing about 20 people in total and has an estimated annual turnover of 7.5 millions pounds. BIL uses a network system that is tailored to the motor trade called Carriage and uses it for marketing, customers' records and service history. In addition, the company has another network of 20 PCs and uses it for the basic business applications and currently uses the Internet in their business.

### *BPC*

BPC is a small company that was established in 1973 and is located over two sites, one in Cambridge and one in London, 95% of their customers are in the London area. BPC is an experienced and versatile single-source publishing service that deals with any type of publication. The range of products includes books, magazines, journals, company histories, brochures, foreign-language editions and multimedia. The company employs about 25 full time staff in total plus up to 100 freelancers who may be working for the company at any one time. The estimated annual turnover is between 1 and 5 million pounds. BPC uses a lot of IT technology including a network of Mac studio that includes on line diary system. The company also has other business applications and about 22 PCs and currently has Internet access.

### *AL*

AL has been in business since 1960 and the company has two distinctive businesses, it designs, manufactures and sells educational engineering equipment to Universities. This accounts for about 80% of their business. The other part is industrial food technology. The company manufactures miniature scale equipment for research and development in food, pharmaceuticals, and beverage industries and these accounts for 20% of their business. AL markets are world-wide and well over 90% of what they make is for export. AL is a small business employing about 40 people and has an estimated annual turnover of between 5 and 7 million pounds. The company has the basic technology of telephone, fax, email and Intranet for internal communication and Internet connection. AL runs a network within the office, and has about 30 PCs and has other business applications such as Microsoft office.

### *FP*

FP is a specialist flooring manufacturing company with 3 divisions. FP is a medium-sized company that was established 15 years ago and employs about 60 people with an estimated annual turnover of 10 million pounds. The company has about eleven offices world wide. FP has grown from a research and development base into the UK's leading manufacturer of specialist flooring products. FP has a project tracking database that allows them to actions against different projects, follow it from beginning to the end. IT plays quite a big part in the company, the company has about 50 PCs and runs a network within the office and has both Internet and Intranet which staff use to send email to other offices.

### *CLR*

CLR is a cigarette paper manufacturing company with 3 manufacturing facilities and is an established company that has been going for many years. CLR has about 80% of the UK market share and an annual growth of 10%. CLR is a medium-sized company employing about 180 people in this site. IT plays quite a big part in their operations and the company has about 45 PCs and runs a network within the office. The company has both Internet and Intranet which staff use to send email to other offices world wide.

### *SAH*

SAH hospice was set up 30 years ago to provide nursing and medical care for people with life-threatening illnesses. SAH is a registered charity and is supported through voluntary donations and by local health authorities. SAH is the biggest hospice in the UK with 66 in-patient beds and is located over two sites. The hospice is a medium-sized organisation employing about 200 people with an estimated annual turnover of about 6 million pounds. Their IT usage includes a network for accounts, patient's records and fund raising. The organisation has in total about twenty PCs and has Internet connection.

## Appendix 10: Glossary

*Information technology (IT)*: is viewed in a broad sense as it refers to any artefact whose underlying technology base is comprised of computer or communications hardware and software.

*Electronic Commerce (EC)*: Zwass (1996) defines electronic commerce as "... the sharing of business information, maintaining business relationships, and conducting business transaction by means of telecommunication networks". He points out that electronic commerce includes not only the buying and selling of goods, but also the various process within individual organisations which support that goal (Zwass, 1996). In a similar manner, Kalakota and Whinston (1996) define electronic commerce as "... a modern business methodology that addresses the needs of organisations, merchants, and consumers to cut costs while improving the quality of goods and services and increasing the speed of delivery. The term also applies to the use of computer networks to search and retrieve information in support of human and corporate decision making" (Kalakota and Whinston, 1996).

*Internet*: is defined in this study as a network of networks, which interchange data using a set of communication standards, called the Internet Protocol Suite (IPS), in particular Transport Control Protocol/ Internet Protocol (TCP/IP). It consists of thousands of computer networks at businesses, universities, and governmental agencies all linked together by phone lines, microwave transmissions, or fibre optics.

*World Wide Web*: The World Wide Web is the application that has stimulated the recent explosion in the use of the Internet. Documents on the www are usually written in hypertext mark-up language (HTML), which describes the layout of the page and the components such as the text and images that it contains. HTML pages are stored at servers known as web servers and the information is accessed using a client application known as a browser such as Netscape's Navigator or Microsoft's Internet Explorer, the browser and web server communicate using the hypertext transfer protocol (Sim and Rudkin, 1997).

*Email*: is defined as the delivery of text messages over a network from one computer to another, generally messages created by a human and intended for one or more people. In addition, files and documents in any format (including software, images, sound and video) can be transferred as attachments to email messages, regardless of where that person is; the message arrives at his computer mailbox within minutes. Often one can exchange numerous messages in a shorter period of time than it would take for one letter to get to its destination via the postal service.