E-COMMERCE INFORMATION SYSTEMS (ECIS) SUCCESS: A SOUTH AFRICAN STUDY

by

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DECLARATION

I, Shaun Pather, declare that the contents of this thesis represent my own unaided work, and that the thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

Signed **Date**

ABSTRACT

As a phenomenon of the 1990s, e-Commerce is relatively new. Its advent offered the promise of new opportunities to businesses and entrepreneurs around the world. The hyperbole associated with the Internet and the Web resulted in a mindset that e-Commerce was an easy road to success. It was believed that this new technology-based approach would revolutionise business in a number of ways, including changing the relationships between the stakeholders and allowing small organisations to play on the global stage. However, the road to business enhancement through e-Commerce has not been easy. Many organisations have not survived their attempts to engage in e-Commerce and others have radically changed their approach since the e-Bubble burst. There were many reasons for the failure of these e-Commerce initiatives. They included poor business ideas, no control of expenditure, lack of general business experience and immaturity, as well as little understanding of the crucial importance of managing the technology through which the Internet and the Web delivers e-Commerce opportunities.

This thesis explores the intricacies of IS within the South African B2C e-Commerce environment and argues that without a coherent understanding of the factors affecting IS success, the implementation of traditional IS evaluation mechanisms may be problematic. A comparative analysis of studies in this field between the pre- and post- e-Commerce eras, ascertained a paucity of theoretical frameworks and a fragmented body of knowledge in the extant literature, with a narrow focus on web-interface issues. Consequently, the main aim of the study was to advance theory in the field of IS evaluation.

The empirical work reported in this thesis examines the role of information systems in facilitating the various components of e-Commerce. In the research a new name for this has been used, viz., e-Commerce Information Systems (ECIS). The research involved analysing evidence that was collected from over 60 interviews as well as from many websites and other documentation supplied by knowledgeable informants from South African B2C e-Commerce businesses. The transcription and coding of the substantive body of qualitative evidence was informed by grounded theory method, hermeneutical analysis, and reflexive interpretation. NVivo was also employed to facilitate the management and interpretation of the evidence.

The research resulted in six findings which offer insights into the drivers of ECIS success and which collectively serve as a set of management guidelines for the e-Commerce environment. Importantly, these findings document the need for customer-centricity throughout the system lifecycle, and bring to the fore the critical importance of harmonisation of business and IS mindsets in understanding ECIS performance. Further reflection, modelling and the juxtaposition of these findings led to the formulation of the ECIS Success Theory, which states:

> *E-Commerce information systems success is underpinned by a mindset which sees Customer-Centricity as one of the primary drivers of e-Commerce. Customer-Centricity pervades the key e-Commerce processes. However, Customer-Centricity alone is unlikely to lead to an optimal e-Commerce solution. For sustained success, business and IS mindsets need to be harmonised. Additionally, as customers' tastes and preferences change, so too should the ability of the business to be responsive to these changes. Responsiveness is realised through the design of agile processes and systems. Implicit in the understanding of these three critical success factors, viz., Customer-Centricity, harmonisation, and agility, is that e-Commerce processes are supported by high quality e-Commerce information systems that are reliable and easy to maintain. To ensure success, all four of these factors need to be integrated into a competent business model. E-Commerce information systems success will be sustainable by the continuous assessment of Customer-Centricity, harmonisation, agility, changing environmental factors, and the quality of e-Commerce information systems.*

This theory and its associated model provides the basis for a coherent approach in the development of specific ECIS evaluation instruments. The theory was refined in the final phase of the research, during which it was presented to both e-Commerce practitioners and members of the IS academic community. Finally the limitations of the research are acknowledged, and several avenues for future research, which have been created by the development of the theory, are identified.

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Generosity is not giving me that which I need more than you do, but it is giving me that which you need more than I do

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- Exclusive Books
- Fundamo
- Health Focus
- Jadica Shipping
- Kalahari.net
- Kulula.com
- Last-minute
- Makro
- Micromesh
- Musica
- Net Florist
- Nu Metro Cinemas
- Old Mutual
- Oodles of Doodles
- Pick 'n Pay Supermarkets
- Porter Motor Group
- Price Waterhouse Coopers
- Pro-Digital
- SA Camera.co.za
- Software Futures
- Spar Group
- Spier Leisure Resort
- Ster Kinekor cinemas
- Take2.co.za
- Trade.net
- Woolworths
- Z-Logic

DEDICATION

For my late grandmother, Iylandam Sivagami Narainsamy

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LIST OF RESEARCH OUTPUTS

The following research outputs were produced during the course of the study:

Journal Articles

- Pather S., Remenyi, D. & De la Harpe, A. 2006. Evaluating e-Commerce success: a case study. *Electronic Journal of Information Systems Evaluation,* 9(1):15-26.

- Pather, S. & Remenyi, D. 2005. Some of the philosophical issues underpinning research in information systems: from positivism to critical realism. *South African Computer Journal*, 35:76-83.

- Pather S., Remenyi, D. & Erwin G.J. 2004. E-Commerce success: the quest for a conceptual framework. *South African Computer Journal*, 32:34-43.

Peer-reviewed conference proceedings

- Pather, S. & Remenyi, D. 2004. Some of the philosophical issues underpinning research in information systems: from positivism to critical realism. In Marsden, G., Kotzé, P. & Adesina-Ojo, A. (eds). *Fulfilling the Promise of ICT: Proceedings of SAICSIT 2004: Annual Research Conference of the South African Institute of Computer Scientists and Technologists, Stellenbosch, 4-6 October.* Pretoria: SAICSIT/ACM: 141-146.

- Pather, S., Remenyi, D. & De la Harpe A. 2004. E-commerce success? kalahari.net™: a South African case study. In Remenyi, D. (ed.). *Proceedings of the 11th European Conference on Information Technology Evaluation, Royal Netherlands Academy of Arts and Sciences, Amsterdam, 11-12 November.* Reading: Academic Conferences: 329-340.

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Invited Seminars

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CHAPTER ONE

E-COMMERCE IN SOUTH AFRICA: AN INTRODUCTION AND BACKGROUND TO THE RESEARCH

Knowledge is like a ship because once it is in the bottle of truth it looks as though it must always have been there and it looks as though it could never get out again
(Collins, 1985)

Overview

This chapter introduces the subject of e-Commerce and explains the background to its prominence in many organisations. In tracing the development of e-Commerce, it describes the hyperbole that led to the bursting of the so-called e-Bubble. The chapter continues to describe the central issue of Information Systems success in the e-Commerce world. It positions e-Commerce in South Africa and it explains the importance of this subject to research in this country. This leads firstly to a statement of the research problem, followed by the research questions, aims and objectives that this study addresses. The essence of the research question is that as ICT plays a pivotal role in e-Commerce, successful e-Commerce Information Systems (ECIS) need to be evaluated and managed in a special way. Following on this, the importance of this research to both academe and the business community is discussed. Finally, an overview of the subsequent chapters is presented.

1.1 Introduction

This research was prompted by the impacts of the information revolution[1] on the business world. The advent of the Internet and the Web in the early 1990s has been one of the catalysts of this revolution. Of the various uses found for the Internet and the Web, one of the more important was its adoption by organisations to facilitate their business with both customers and suppliers. The use of the Web as a platform to conduct business gave birth to the practice of electronic commerce, or

[1] One of the central pillars of the new economy is Information. The term *information revolution* is preferred instead of terms such as *Information Economy* or *Information Society*, in order to draw a parallel to the previously used terms, *Agricultural Revolution* and *Industrial Revolution*. The Information Revolution therefore can be ascribed to the substantive increase in the availability of information due to the use of networked computers, the Internet and the Web in particular.

more commonly, e-Commerce. According to Delone and McLean (2004: 31), e-Commerce can be defined as the use of the Internet to facilitate, execute, and process business transactions. Thus at the core of all e-Commerce activities is the application of Information and Communications Technology (ICT). But unlike many traditional organisations, where ICT services may only be supportive and not mission critical, those organisations which are pursuing e-Commerce are much more reliant on this technology. If the computers or the telecommunications falter the e-Commerce organisation may come to a halt. It is therefore clear that ICT in an e-Commerce environment is central and that it needs to be understood, managed and its operation evaluated or assessed in a different way. In this research I have referred to ICT used to deliver e-Commerce as e-Commerce Information Systems (ECIS).[2]

1.2 The rush to e-Business

In the 1990s, the commercialisation of the Internet transformed the use of Information and Communication Technologies[3] (ICTs) in the business world. Over this period of time it has been estimated that hundreds of billions of dollars have been spent on e-Commerce or e-Business (Sarner, 2004).

It was also estimated that in the mid 1990s there were some 30 million Internet users (Killen & Associates, 1996). But by the end of the 1990s this number was said to be more than 400 million. At one point both the

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[2] With the advent of the web many businesses positioned and deployed IS to compete in the electronic market place. Examples of IS deployed in e-Commerce businesses include database management systems, order processing systems, and web-content management systems, to name just four. In this thesis, ECIS is used to refer to the collective IS deployed by e-Commerce businesses. (Refer to section 2.4.)

[3] Information Technology (IT) has been used as an encompassing term in the past to refer to computing technologies and all related artefacts. However, in the current era, the role of networking, and hence communicating, is virtually inseparable from any other aspect of Information Technology. Thus the term ICT is increasingly being used instead of IT or IS.

CNN and the BBC claimed that there were some 20 million web-based businesses in existence which were commonly referred to as Dot.Coms. At the height of this enthusiasm for e-Commerce, organisations were being told by the media that Internet and Web-based business would effectively change the world. Some examples of the hyperbole surrounding Internet or Web-facilitated business[4] included statements such as: '*Dot Com or Be Gone!*', '*be Digital or be Toast!*', '*Get Web or be Dead!*' (Sterne, 2002).

By the year 2000 the business world had witnessed the "catastrophic collapse" of many "dot-coms"[5] (Ames, 2001). However, it is commonly believed (Lee, 2001; Barnes & Hinton, 2004) that despite these failures, e-Commerce is a significant business issue with important successes, e.g. e-Bay, Amazon, Dell, Tesco, Ryan Air, Egg, and Google, to mention only a few international businesses. In South Africa companies such as Kalahari.net, netflorist.co.za, kulula.com, and cybercellar.co.za are further examples of business that have laid claim to successful e-Commerce (World Wide Worx, 2004). Notwithstanding these diametrically opposing circumstances regarding e-Commerce success, there are various sources (Chan *et al.*, 2001; Stansfield & Grant, 2003; Sarner, 2004) which suggest that there is little doubt that, if implemented correctly, an e-Commerce strategy can contribute substantially to business profits. In the current era, it is now accepted that e-Commerce is generally no longer a subject of extensive hyperbole (Fairhurst, 2002). This is borne out by a recent survey conducted by Forrester Research (Bartels *et al.*, 2006) in which decision-makers in enterprises from around the world were asked to prioritise their major technology themes

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[4] Web-facilitated business refers to businesses that use the Web to conduct business. This ranges from having just a static web-presence, advertising company details, products etc, to offering a full range of services including the sale of goods and services, account queries, distribution of products and service, etc. Angehrn (1997) describes web-facilitated business under four headings i.e. Information, Communications, Distribution, and Transactions.

[5] The term dot-com is commonly used (e.g. Barua *et al.*, 2001) to refer to an organisation that operates its business primarily on the Internet.

for 2006. These executives ranked "*the initiation of Internet and e-Commerce activities*" as one of their top six priorities (Bartels *et al.*, 2006). Today organisations understand the potential of e-Commerce. Many organisations are now in a position to focus on how they can effectively use the Internet and the Web, together with sound management practices to achieve business success. Consequently, questions concerning how to ensure the successful use of ICT have come to the fore in the e-Commerce business world.

1.3 IS Success[6]

From the time of the first commercial application of computers, businesses have depended on IS to varying degrees. Stylianou and Kumar (2000:99) sum up the strategic importance of IS in business quite aptly in arguing that:

> "*The importance of information technologies and the information systems function is no longer of debate among business people. The question, rather, is how an organization can take best advantage of IT in order to support its operations, add value to its products and services, and gain a competitive edge in the marketplace*".

DeLone and McLean (2003:10) have also contributed to this discussion by stating that:

> "*the measurement of IS success or effectiveness is critical to our understanding of the value and efficacy of IS management actions and IS investments*".[7]

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[6] IS Success is defined as the extent to which IS meet the expectations of organisations in respect of their facilitating the realisation of business objectives. The definition of success is dealt with in more detail in Chapter 2.

[7] The terms *IS Success* and *IS Effectiveness* are used interchangeably in the literature (e.g. Seddon *et al.*, 1999). In this thesis the term IS Success will be used mainly, except in circumstances where the literature being cited uses the term *IS Effectiveness.*

Thus IS Success measurement has been one of the key issues of concern both in IS management practice and research (Seddon *et al.*, 1999). Research into IS Success has posed a hurdle to the IS community in that it offers both conceptual challenges as well as implementation difficulties. These issues have been researched by many academics (Ein-Dor *et al.*, 1981; Fuerst & Cheney, 1982; Ives *et al.*, 1983; Ives & Olson, 1984; Delone & McLean, 1992; Remenyi *et al.*, 2000; Whyte & Bytheway, 1996; Watson *et al.*, 1998; Seddon *et al.*, 1999; Saunders & Williams, 2002; Delone & McLean, 2004), each of which has taken a differing stance as to what constitutes success.

1.3.1 Models of IS Success

Research over the past three decades has resulted in a number of approaches to the evaluation of IS Success. These include: system usage (Srinivasan, 1985; Trice & Treacy, 1986); information value (Gallagher, 1974); user satisfaction (Hamilton & Chervany, 1981; Ives *et al.*, 1983; Bailey & Pearson, 1983; Shaw *et al.*, 2002) and more recently service quality (Pitt *et al.*, 1995; Kettinger & Lee, 1995; Van Dyke *et al.*, 1997; Jiang *et al.*, 2002) to mention just four approaches. Such varied approaches to IS Success measurement suggest a lack of agreement regarding the question of what constitutes IS Success.

This diversity of approaches was from an early stage a cause of concern for both researchers and practitioners. One of the oft-cited papers in the literature is that of DeLone and McLean (1992). In their paper, these authors synthesized 100 empirical IS Success measures (published between 1981 and 1987) into a unified model. The resultant *IS Success Model* (DeLone & McLean, 1992) has been regarded by many researchers as a major contribution to this area of research (Molla & Licker, 2001; Garrity *et al.*, 2005) and has been the focus of several studies since 1992. In 2003 this model was updated (DeLone & McLean, 2003) to reflect changes observed in the literature over the

decade from 1992 to 2002. These authors argue that their updated model of IS Success is also applicable to the e-Commerce environment (DeLone & McLean, 2004). However, they acknowledge that the two examples they use to demonstrate application of the updated IS success model to e-Commerce business are *"compelling logically"* (DeLone & McLean, 2004:41), but require empirical testing.

1.3.2 Inadequacy of IS measures

Despite this large amount of research activity into IS Success, there have been several authors who are of the view that this area of research has not been adequately investigated (Miller & Doyle, 1987; Watson *et al.*, 1998; and Molla & Licker, 2001; Zhu & Kraemer, 2002; Love *et al.*, 2004). There is considerable difficulty in being able to measure IS Success and it has been suggested that the search for appropriate metrics has resembled the proverbial search for the Holy Grail (Arnold, 1995). Other sources, such as Seddon *et al.* (1999), describe the question of IS Success as one of this field's "*haunting problems*". They further argue that although there is a thriving research community that offers answers to questions regarding new ways to manage IS, and new ways of designing and building IS, there are few effective guidelines about how the success of IS should be assessed.

1.3.3 Success of ECIS

Notwithstanding the reported difficulties in developing measures of IS Success, business managers who follow sound management practices, will still require indicators of the success of their IS investment. This is also true in the e-Commerce environment, especially if one considers the large sums being invested in Internet-based business. Thus questions concerning IS Success are equally important to managers of e-Commerce businesses. There are several reasons why researchers should be concerned with ECIS Success.

As each year passes more and more money is being spent by consumers on online purchases. Gartner research reports that business-to-consumer (B2C) online purchases in the US continues to grow at an extraordinary rate, year after year with an increase of approximately $5 billion to $65 billion in 2004 (Sarner, 2004). In South Africa, there has also been a positive growth in B2C expenditure. (Refer to Table 1.1.). Thus with an ever increasing growth of online sales, managers of e-Commerce businesses will be keen to maximise the potential from ECIS. Consequently, questions pertaining to IS Success that have arisen over the past 30 years are perhaps of even greater importance within e-Commerce businesses.

The literature indicates that e-Commerce businesses have different priorities in terms of improving performance measurement as compared with those of traditional or brick and mortar[8] organisations (Adams *et al.*, 2001: 4). The issues relevant to IS Success in e-Commerce are different from brick and mortar businesses for at least three reasons. These are:

- There is an increased reliance by e-Commerce business on ECIS to keep the business operative.
- ECIS are considered to be considerably different from brick and mortar IS in terms of their scope and focus (Zwass, 1996; Garrity *et al.*, 2005).
- The context of the IS end-user in the e-Commerce environment has dramatically changed. Online consumers are simultaneously IS users (Koufaris, 2002). Thus the success of ECIS is now also dependent on the satisfaction of users who are located beyond the traditional business boundary.

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[8] The term "brick and mortar" is used describe businesses with a physical presence in the market place. Traditionally customers travel to the premises of a brick and mortar business in order to purchase goods. In the case of e-Commerce business, customers "visit" the store via the medium of the Web.

There are several sources of support for conducting research into ECIS Success. For example, Garrity *et al.* (2005:486) argue that without a clear understanding of the dynamics of ECIS Success to guide businesses, proper strategies and systems designs are mere speculation. They suggest that a "*central activity for researchers will be to define and operationalise the constructs for understanding the success of electronic commerce systems*". Other authors such as Lee and Kouzar (2005) aver that decision-makers at e-Commerce organisations continue to make vast investments in developing websites for e-Business without having clear knowledge of what factors contribute to developing a high quality website and how to measure effects on e-Business success. Lastly, Sterne (2002) has identified a lack of success measures as among the top five barriers to the development of e-Business.

1.4 A situational analysis of the e-Commerce environment in South Africa

1.4.1 South African ICT infrastructure

South Africa is a country spanning 1 219 090 square kilometres, with a population of approximately 48 million people[9], of whom 9.9% (4 780 000) are Internet users (Internet World Stats, 2005). Known as the gateway to Africa, South Africa is home to 6% of Africa's population, and produces 18% of the continent's GDP (DTI, 2004).

The mainstream ICT supply sector is described as being "broadly healthy and profitable" (World Wide Worx, 2003), with a "world-class internet and e-commerce sector" (South African Business Guidebook, 2004:204). South Africa ranks twenty-third in telecommunications

[9] From a size perspective South Africa is approximately five times larger than the UK. The population density of South Africa is 36,35 per km^2 compared with 246,88 per km^2 in the UK.

development in the world and has a large network infrastructure, necessitated by the country's large geographical area. Covering about 156 million circuit-kilometres, the transmission network constitutes the backbone of all telecommunications services. The telecommunications network is almost wholly digital. Digital microwave and optical fibre serve as the main transmission media for the inter-primary network, interconnecting all major centres. The country has approximately 4,9 million installed telephones and 4,3 million installed exchange lines representing 39% of the total lines installed in Africa (International Marketing Council, 2003).

South Africa is also the twentieth largest consumer of IT products and services in the world, ranking eighteenth in terms of Internet usage. The promulgation of the Telecommunications Act of 1996 has resulted in the accelerated rollout of IT infrastructure. In 2001, the ICT Development Council was introduced, focusing on IT training and certification, wireless development, pilot laboratories, niche software development and niche application enhancement, call centres and the establishment of infrastructure and application hosting for Africa. Most international corporates, recognised as leaders in the IT sector, operate subsidiaries from South Africa, including IBM, Unisys, Microsoft, Intel, Systems Application Protocol (SAP), Dell, Novell and Compaq (DTI, 2004).

The Map of the IT and Telecoms Sector (MITTS) survey of the ICT sector over 2002-2003, indicates that "*South Africa's top ICT companies have seen a hefty growth in turnover for the past two years*" (World Wide Worx, 2003). This report also reveals that the annual sales of these companies in 2002 were R107 billion which reflects an increase of 21% over 2001. A more recent market analysis of listed ICT shares shows that "*share prices of ICT companies in South Africa increased by 30% in 2004, compared to the American Nasdaq index which fell by more than 10% in the same period*" (World Wide Worx, 2005). With such high expenditures in ICT, business executives expect to see a return on their

investments.[10] Such expectation will be especially relevant for executives in the e-Commerce sector which is highly dependent on ICTs.

More recently the entry of broadband technologies has been seen as an important factor in further catalysing Internet use in South Africa. According to Goldstuck *et al.* (2006:12)

> *"In both the wireless and fixed line environments, the market is moving towards an explosion of growth, with healthy competition and a range of different technologies which should be able to provide true broadband in the future".*

This brief overview indicates that there is a modern and growing ICT infrastructure in South Africa. From a technology perspective, this augers positively in terms of the continued growth and sustainability of e-Commerce business in this country.

1.4.2. E-Commerce activity in South Africa

Even though South African e-Commerce business could have learnt more from the mistakes of their overseas counterparts (Buhrmann, 2002: 49), the local market in South Africa was not immune to the e-Commerce hyperbole that caused the dot.com crash.[11] In 2002 it was reported that 35% of the online stores that were in business at the end of 2000 no longer existed at the end of 2001 (Goldstuck, 2002:13). In 2005 the situation was not that different. Goldstuck *et al.* (2006: 4) reported that more than 25% of online retailers that were in business at the end of 2004, had closed down their sites during 2005.

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[10] According to Harrison (2004) 57% of CEOs acknowledge that optimal use of Information Systems is a key to gaining competitive advantage, and 91% of CEOs expect IS to have a significant bottom line impact.

[11] The online retailers ShoppingMatrix.com, StopQ.com and banking venture bluebean.co.za are just three examples of well-known South African e-Commerce ventures that shut down within a year of opening for business.

A survey of online retail activity (Goldstuck, 2002)[12] provides insight into the 2000-2002 state of e-Commerce activity in South Africa. This survey reports that online retail trade in South Africa doubled between 2000 and 2001 to R162 million. The report describes online retail in South Africa as being *"at a very early stage of its market penetration, and remaining deeply immature in its implementation"* (Goldstuck, 2002:10). This finding is corroborated by a study conducted by the Department of Trade, Industry and Statistics South Africa, which established that *"the use of the Internet for commerce, especially by small and medium-sized businesses, is still in its infancy in South Africa"* (Sunday Times: 2004).

While there was an initial favourable growth in online sales during the 2000 to 2002 period, a research report released in June 2004 indicates a *"slow down in growth of online retail"* representing a *"mere 0.14% of the overall retail market in South Africa"* [13] (World Wide Worx, 2004). Table 1.1 shows that the growth of online retail has been slowing down in the period 2000 to 2005. This could be attributed to a variety of issues.[14] For example, one South African study into online banking found that that a majority of customers were dissatisfied with aspects of user friendliness of the websites (Singh, 2004).

Table 1.1/...

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[12] The Goldstuck report is an annual survey conducted by a private research enterprise *World Wide Worx*. It is the only source of in-depth analysis of the online retail environment in South Africa, and is often quoted in the media and in government reports.

[13] Gartner Research reports that online sales in the US represents 1,7% of the total retail sales (Sarner, 2004). This makes an interesting comparison with South Africa, where online sales comprise just 0,14% of total retail.

[14] Besides Singh (2004) there were no other empirical studies that could be found that investigated the reasons for slow growth in the South Africa.

Table 1.1: Online retail growth in South Africa
Source: World Wide Worx (2005:19)

Year	US $ 000 000s	% Growth
1996	$0.11	
1997	$0.22	106%
1998	$0.50	127%
1999	$2.36	367%
2000	$11.71	396%
2001	$23.14	97%
2002	$36.00	55%
2003	$48.71	35%
2004[15]	$61.14	25%
2005	$73.43	20%

1.4.3 Role of the South African government

South Africa is a young democracy that emerged from the apartheid era just twelve years ago. The development of the country's economy is seen as being integral to the success of this transformation. The opportunities presented by the use of ICTs in business are viewed by the government as one of the means by which economic growth can be sustained (South Africa, 2002).

The South African government has been proactively promoting the use of ICTs in the business arena. In his state of the nation address in 2002, President Thabo Mbeki, acknowledged that:

> *"...a critical and pervasive element in economic development in the current age is the optimum utilisation of information and communications technology".*

The government is particularly concerned with facilitating the economic empowerment of previously disenfranchised groups. To this end a

[15] The extent of e-Commerce activity in South Africa ($61.14 million in 2004) is better understood when compared to that of the US which is reported as being $65 billion (Sarner, 2004) in the same period.

policy of promoting economic growth through the development of Small and Medium Enterprises (SMEs) has been adopted. As part of its strategy to promote such growth, the government has implemented a plan to promote the adoption of ICTs, especially Internet technology amongst business (South Africa, 2002:9).

Examples of the government's serious intent to promote business use of the Internet, have been the promulgation of the Electronic Communications and Transactions (ECT) Act (Act 25 of 2002) and the launch of the Online Publisher's Association (OPA). The ECT Act is especially significant as it encapsulates a common policy to govern electronic trading in this country. In the preamble of this piece of legislature, specific mention is made of the need to "*promote skills development in the areas of information technology products and services in support of electronic transactions*" as well as to promote "*business strategies for SMMEs*[16] *and other businesses to utilise electronic transactions*" (South Africa, 2002:8-9).

1.4.4 Increasing levels of online activity and e-Commerce

Both locally and internationally, there has been a steady growth in the number of Internet users (Internet World Stats, 2005). Gartner research predicts that by 2007 approximately 1,35 billion people worldwide will be online (Sarner, 2004). In South Africa the number of Internet users has steadily increased since 2000. In 2005 there were an estimated 4,7 million Internet users in the country (Internet World Stats, 2005).

This increase in the Internet user base has had a positive impact on e-Commerce. In South Africa, online retail sales increased by 51%

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[16] In South Africa, the term Small, Medium and Micro Enterprises (SMMEs) is often used, as opposed to Small and Medium Enterprises (SMEs), which is used in literature emanating from countries in other parts of the world.

between 2003 and 2005 (World Wide Worx, 2005). These statistics are a clear signal that the Internet as a medium for business is responsible for channelling substantive amounts of turnover for businesses of various persuasions. Indeed, with such lucrative possibilities of turnover, it can be expected that businesses will continue investing in ICTs either as new dot.com businesses, or as expansions of traditional brick and mortar business.[17]

1.5 The research problem

The discussion in the foregoing sections has highlighted several issues that contributed to my understanding of the research problem.

- The world of business has moved beyond the first wave[18] of e-Commerce hype. In the current era, a more mature business approach has developed. E-Commerce managers now understand that an online presence in itself will not produce sustained growth and profitability. Rather managers are required to re-evaluate their current business strategies especially in relation to how ECIS contribute to e-Commerce success.
- The evaluation of IS Success is a challenge for both the practitioner and IS research communities. A number of studies have been conducted, with a variety of outcomes. However the questions concerning ECIS Success, specifically, have not been thoroughly investigated. There is currently a lack of a coherent understanding of the connection between ECIS Success and e-

[17] Current trends indicate that e-Commerce adoption in South Africa has been on the increase. The number of retail websites in South Africa increased from 719 at the end of 2003 to 826 at the end of 2005 (Goldstuck *et al.*, 2006).

[18] There are some suggestions that we could be entering a second wave, referred to as Web 2. This thinking has been prompted in part by the e-Bay purchase of SKYPE (Schofield, 2005) for several billion dollars. SKYPE is a relatively new business which has yet to make a profit. Additionally the term Web 2 is being used to describe more personal applications than were offered before.

Commerce. Importantly, there is an absence of empirically grounded theories that offer insight into ECIS Success.

- Although at present there is a relatively low adoption of e-Commerce by consumers, current trends indicate that this is steadily increasing.

In light of the above, the following research problem has been identified:

The literature highlights the relevance of two central issues to the research problem. Firstly e-Commerce is considered to be an important business issue in the new South African economy. Secondly ECIS are central to the success of e-Commerce. However some authors argue that this technology is not yet applied in an optimal way. This calls for a better understanding of how ECIS can be effectively managed. In order to optimise ECIS managers of e-Commerce businesses are required to evaluate the success of these systems. They therefore require a comprehensive understanding of the factors that affect ECIS Success.

1.6 Research questions

The formulation of the research questions was motivated by a literature review as well as by discussions with a number of academics and e-Commerce practitioners. As a result of these discussions, I ascertained that there was a lack of a well-founded, coherent understanding of the concepts associated with ECIS Success. Without a conceptual basis for understanding ECIS Success, the implementation of any evaluation mechanism would prove to be problematic. Therefore a logical first step would be to investigate ECIS Success factors, and to develop a theory to explain the phenomena associated with success. Thus, the main research questions that this study addresses are as follows:

In B2C e-Commerce businesses:

a. How do ECIS contribute to successful business?
b. What are the drivers of ECIS Success and how do they relate to one another?
c. What are the important management issues that affect the success of ECIS?

1.7 Research aims & objectives

In pursuance of the research questions above, the specific aims of this study are:

- to review existing literature with regard to IS Success and its evaluation;
- to investigate the research questions through the collection of empirical evidence[19] from knowledgeable informants within the South African e-Commerce environment;
- to develop a theory regarding ECIS Success; and
- to confirm or validate this conjecture with knowledgeable stakeholders in the field.

1.8 Research Design & Methodology

The research design, in using a critical-realist intellectual underpinning, is oriented to the qualitative paradigm so as to facilitate the objective of theory development. Empirical evidence was gathered from e-Commerce practitioners until a point of theoretical saturation was reached. A total of 65 semi-structured interviews were conducted with knowledgeable informants from 36 businesses between March 2003 and

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[19] The term data usually implies numbers, and is more often associated with quantitative studies. In this study, in keeping with the notion of qualitative data in the form of text, I prefer to use the term *evidence* as opposed to data.

November 2005. In addition to interview-transcripts the evidence also comprised business documentation, information gleaned from business' websites and field-notes. This evidence was analysed through the combined application of an adapted grounded theory method, hermeneutics and reflexive interpretation. The analysis and interpretation of the evidence was an iterative process that inductively led to the derivation of six major findings. These findings, which are presented as a higher order narrative, provide an in-depth insight into the pertinent IS management issues that impact on ECIS success. Finally, the juxtaposition of these themes form the foundation of the theoretical contribution of this thesis, viz., an ECIS Success Theory.

1.9 Importance of the research

The recorded high rate of failure of e-Commerce ventures in South Africa (Goldstuck, 2002) and the relatively slow growth of online retail sales (World Wide Worx, 2004), bear testimony that local e-Commerce businesses can benefit from the outputs of this research. South Africa has the technological infrastructure, and an existing core of businesses that have harnessed the commercial capability of the Internet. However, the adoption and use of e-Commerce in South Africa is considered to still be in its infancy, when compared with the rest of the world. Current trends suggest that the rate of adoption of e-Commerce is on the increase. Thus the research outputs from this study will be of importance as e-Commerce adoption evolves in South Africa. Of course the increasing rate of adoption in itself is not an indication of successful e-Commerce. As several authors argue (Lee, 2001; Satish & Raman, 2002; Benbasat *et al.,* 2000), the more effectively we are able to implement IS, chances of failure are reduced, and the benefits to the organisation and its customers are greatly enhanced. Therefore the findings of research into ECIS Success will contribute towards *successful* e-Commerce adoption.

This research is of importance to the academic community as well. In the current literature it is clear that questions concerning IS Success in general, are the subject of substantive debate, with a large number of studies published on this topic. However little has been done to extend the IS Success debate to the context of e-Commerce business. In the literature there is a fragmented approach to ECIS Success. An ECIS Success Theory will therefore be an original contribution to the body of knowledge.

1.10 Overview of the thesis

A brief overview of the remainder of the thesis is as follows:

CHAPTER TWO: IS SUCCESS: PRINCIPAL CONCEPTS, THEORIES AND MODELS

This chapter explores a range of ideas concerning e-Commerce Information Systems, the factors affecting its success and the evaluation thereof. The chapter commences with a discussion of the background to e-Commerce and an overview of the various business models that are in use today. The concept of e-Commerce Information Systems (ECIS) is thereafter introduced. Following on this, the history of how IS has impacted on business over the years is explored. The next section contextualises the field of IS Success within this study. This sets the stage to review how IS success has been approached in the literature that deals with e-Commerce business, as well as literature from the pre-e-Commerce era. Thereafter a sample of studies is used to conduct a comparative analysis of e-Commerce and pre- e-Commerce studies. Lastly, the salient aspects of the discussion are reviewed and these are weighed against the principal research questions of the study. From the work undertaken in Chapter Two it is clear that the research questions remain a challenge and are of importance to the academic community.

CHAPTER THREE: PHILOSOPHICAL FOUNDATION AND RESEARCH DESIGN

This chapter is concerned with the epistemological influences on this research, and key methodological issues relevant to this study. The chapter describes the research design, and provides the raison d'être behind the choice of approaches that have been pursued in this research. An argument is presented as to why a critical-realist framework is an appropriate underpinning for this study. Thereafter the two main paradigms of quantitative and qualitative research are contrasted, and the use of the semi-structured interview technique as the primary method to collect evidence is motivated. After presenting a framework for developing the theory, the chapter concludes by discussing how qualitative research should be evaluated.

CHAPTER FOUR: STRATEGIES FOR THE COLLECTION AND ANALYSIS OF EVIDENCE

Using the research design presented in Chapter Three as a basis, this chapter firstly provides details on how the qualitative research method was employed in this study and especially how it was applied in the process of gathering the evidence for the development of the theory. The next section of the chapter discusses techniques for analysis, and concludes that the best approach to take is to adapt the grounded theory method and apply both hermeneutical and reflexive interpretation. Following on this, details of the method of analysis are presented. I describe how analysis proceeded from inductive identification of concepts, to a higher order narrative. Lastly, I discuss how a computer-aided qualitative data analysis software (CAQDAS) package was used to facilitate the manipulation and interpretation of the evidence.

CHAPTER FIVE: RESEARCH FINDINGS: TOWARDS AN ECIS SUCCESS THEORY

In this chapter the outcomes of the analysis are presented as a higher order narrative. The higher order narrative is the penultimate step towards the derivation of a theoretical conjecture and is presented as six inter-related findings. The in-depth discussion of these six findings articulates a detailed response to the principal research questions of this study. It is based on the collective body of evidence and provides both a rich and detailed insider-view of how ECIS is deployed and managed within e-Commerce businesses in South Africa.

CHAPTER SIX: ECIS SUCCESS: A THEORETICAL CONTRIBUTION & CONCLUSIONS

This Chapter brings the research to a conclusion, by presenting an ECIS Success Theory, which is a contribution to the theoretical body of knowledge. The Chapter firstly discusses how the theory was derived from the findings, after which the importance of the new theory and its relevance to e-Commerce businesses and academe are examined. Following this, the research outputs are evaluated in terms of three fundamental qualitative research criteria, viz., credibility, transferability and dependability. The latter includes a presentation of an intellectual and a physical research audit trail. Several limitations of the study are thereafter reflected upon, before avenues for future research are discussed. The chapter ends with a conclusion that the research has been valuable both to the researcher, and also to the community of stakeholders in which the research was conducted.

CHAPTER TWO

IS SUCCESS: PRINCIPAL CONCEPTS, THEORIES AND MODELS

"The key question is not whether to deploy Internet technology, but how to deploy it"
(Porter, 2001:64)

Overview

This chapter explores a range of research perspectives concerning IS, the factors affecting its success and the evaluation thereof. These perspectives are based on authors who are recognised as authorities and thought leaders in the academic community. They make it clear that that this field of study is appropriate for academic research at the doctoral level and that there are appropriate research questions to answer.

The chapter commences with a discussion on the background to e-Commerce and an overview of the various business models that are in use. The concept of e-Commerce Information Systems (ECIS) is then introduced. Following on this, the history of how IS[1] has impacted on business over the years is explored, i.e., from the Automate to the current Transfigurate phase. The next section contextualises the field of IS Success by firstly examining various definitions of success, then organising the IS Success literature into a framework based on the systems development life cycle, and lastly by demarcating the scope of this study within this framework. This sets the stage to review the approaches to the study of IS Success both within e-Commerce business, as well during the pre- e-Commerce era. The review incorporates a discussion of IS Success models, along with an overview of the user-satisfaction, service-quality, and systems-quality dimensions of IS Success. Thereafter, a sample of studies is used to conduct a comparative analysis of e-Commerce and pre-Commerce studies.

Lastly, the salient aspects of the discussion are reviewed in relation to the principal research questions of the study. From the work undertaken in this chapter it is clear that the research questions raised in Chapter One remain a challenge and are of importance to the academic community.

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[1] Note that the acronym *IS* is used in this thesis as both singular and plural, i.e., *Information System* or *Information Systems*.

2.1 Introduction

By the end of the 1980s it was estimated that in the preceding decade the US economy had invested one trillion dollars on ICT (Willcocks & Graeser, 2001). In simple terms, i.e., not discounted money, this was an average of 100 billion dollars a year. However, by the mid-1990s this sum had increased to about 250 billion dollars per year. In the US alone, during the past six decades, business investment in IT has become an increasingly larger component of the US GDP, with the ratio of business investment in IT to the GDP rising from 1% in the 1950s to more than 4% in the current era. Forrester Research forecasts that IT spending in the US will increase from 800 billion dollars in 2005, to almost 1000 billion dollars in 2008 (Bartels, 2004). This represents a 25% increase in expenditure over just three years. In South Africa, ICT expenditure, although much lower than that of the US, also reflects similar growth trends (World Wide Worx, 2003).

Two central issues influenced the extraordinary growth in expenditure during the 1990s. The first of these was the fear that old legacy systems might cause damage to the operations of organisations as the year 2000 approached. The second reason was the unprecedented opportunities presented by the Internet and the Web. As a result, in the past decade, there has been a boom in e-Commerce and the associated investments in IS (Dehning *et al.*, 2004). The subject of this dissertation, which is motivated by the second of these issues, concerns how IS are successfully deployed in the B2C e-Commerce retailing context.

ICTs have been deeply ingrained in almost all spheres of our lives, so much so that today ICT has become the primary driver of a new vision for our way of life, referred to as the information society (Turner, 2000). In the business sector, there is an increasing awareness that the implementation of IS is indispensable to the provision of organisational services. As a result, the implementation and management of IS present

both major opportunities and challenges to businesses (Joshi & Pant, 2002). However, the need for flexibility, competitiveness, and improved performance has meant that many businesses continue to adopt IS without rigorous evaluation. It has been argued that businesses have become so reliant on their IS for strategic, tactical and operational benefits, that they overlook the importance of evaluating the success of such investments, and instead favour a more intuitive evaluation approach that is often nothing more than an act of faith. (Byrd & Marshall, 1997; Ezingeard *et al.*, 1998; Irani *et al.*, 1999; Irani *et al.*, 2000).

The increased complexity of IS, combined with the uncertainty and unpredictability associated with its benefits and costs, clearly points to the need for evaluation procedures that offer companies a deeper insight into the impact of IS investment (Irani *et al.*, 2000). The question of IS Success and its evaluation is one that has generated considerable interest among researchers over the past twenty years. Evidence of this interest abounds in the literature, with special issues of journals focusing on this topic. There are also several books such as Wiggers *et al.* (2004), Remenyi *et al.* (2000), Willcocks and Lester (1999), to name but a few, as well as at least one annual conference devoted to this issue. Such a huge effort by the IS research community is indicative of the importance attributed to the success of IS. Since the advent of Internet-facilitated business in the 1990s, the concerns around IS Success have added new questions to the agenda of IS researchers.

2.2 E-Commerce: a brief background and definitions

The Internet, which is essentially a large network of interconnected computer networks (Schneider, 2002), has had a profound impact on the world of business. From its military, research and academic background, the Internet has evolved into an important business tool (Lawrence *et al.*

2000). The development of the HyperText Transfer Protocol (HTTP) in 1991, which gave birth to the Web, set the stage for the commercial adoption of the Internet by businesses.[2]

E-Commerce is often thought to refer to the buying and selling of goods through the Internet only. However, e-Commerce involves much more than electronically mediated financial transactions between organisations and customers (Chaffey, 2002). Table 2.1 presents a range of perspectives regarding what is considered as e-Commerce.

Table 2.1: E- Commerce from four perspectives
(Source: Kalakota & Whinston, 1996: 3)

PERSPECTIVE	DESCRIPTION
Communications	To deliver information, products, services and payments over the telephone, communication networks and other means.
Business	To automate business transactions and work flows
Service	To cut service costs while improving the quality of goods and increasing the speed of service delivery.
Online	To provide the capability of buying and selling products and information over the Internet.

Given these varying perspectives, there are a number of definitions of e-Commerce, e.g.

> *"the sharing of business information, maintaining business relationships and conducting business transactions by means of telecommunications networks"* (Zwass, 1996);
>
> *"online commercial activity"* (Strader & Shaw, 1999);
>
> *"the use of electronic networks to facilitate commercial transactions" (Turner, 2000);*
>
> *"the conduct of business among e-business and consumers"* (Cox & Dale, 2001); and
>
> *"the use of the Internet to facilitate, execute, and process business transactions"* (Delone & McLean, 2004).

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[2] Refer to Oz (2002: 3) for a detailed timeline of the Internet from 1962 to 1999.

In the context of this study, e-Commerce refers to web-facilitated sales of products, services, and information by businesses to consumers, i.e., B2C e-Commerce.

2.3 E-Commerce business models

A business model is a set of planned activities designed to create profit in a marketplace. According to Weill *et al.* (2005:5), "*a business model consists of two elements, viz., what the business does, and how the business makes money doing these things*". Magretta (2002:86-87) suggests that a good business model remains essential to every successful organisation, whether it's a new venture or an established player. This is supported by Quaddus and Achjari (2005), who maintain that one of the reasons for e-Commerce failure is that companies do not have well-planned business models.

e-Commerce businesses have adopted a number of different business models which employ the unique qualities of the Internet and the Web (Timmers, 1998). Wang (2001:304) defines an e-Commerce business model as

> *"a competition strategy for the marketplace and a structure of business processes for the entire electronic trade including marketing, advertising, negotiation, purchasing, logistics of products, payment with means of security, post-sales service, and post-sales intelligence".*

Angehrn (1997) developed the ICDT Model (Figure 2.1), which facilitated our understanding of the different Internet strategies used by companies. Today, almost ten years later, the ICDT model is still relevant, as e-Commerce businesses are found to be operating in one or more (or a combination) of the virtual spaces indicated in the model.

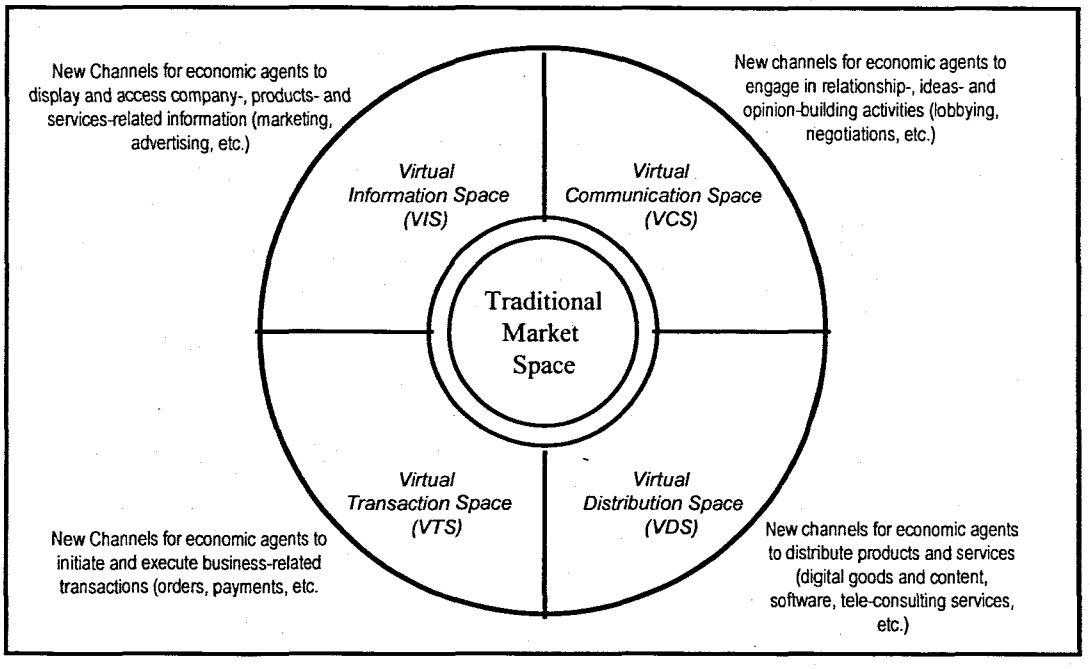

Figure 2.1: The ICDT Model
(Source: Angehrn, 1997:362)

The ICDT Model describes the segmentation of the space of new business opportunities created by the Internet, viz., the virtual information, communication, distribution and transaction spaces. These four virtual spaces are described by Angehrn, 1997:362-363) as follows:

- *Virtual Information Space (VIS):* The VIS consists of Internet-based channels through which economic agents display information about themselves, and the products and services they offer. From a consumer perspective, the VIS provides an efficient approach of gathering information and comparing market offers.
- *Virtual Communication Space (VCS):* The VCS allows economic agents to meet to exchange ideas and experiences, engage in relationships and create different types of communities. This has created virtual communities of similar interest, e.g., Internet-based news and user groups, whose members bypass geographical constraints.
- *Virtual Distribution Space (VDS):* The VDS represents three strategic options for Web business. The first option relates to a distribution channel suitable for a variety of products and services.

Electronic books, articles, pictures, music and video tracks belong to this category. As a second option, businesses use the Web as a distribution channel for non-physical services such as text, voice or video-based consulting. Thirdly, the VDS can be used to enhance the traditional products and services offered by businesses by allowing customers to access customer-support services such as product-related information, training and product updates.

- *Virtual Transaction Space (VTS)*[3]*:* The VTS consists of Internet-based channels through which businesses can exchange formal business transactions such as orders, invoices and payments.

Since the publication of the ICDT model in 1997, researchers have analysed e-Commerce business models from many different perspectives and frameworks (Hogue, 2000; Barua *et al.*, 2001; Weill *et al.*, 2005). Examples of these are Business to Consumer (B2C), e.g. Amazon.com, Business to Business (B2B), e.g., eSteel.com, Consumer to Consumer (C2C), e.g., eBay.com, Business to Government (B2G) and Mobile Commerce (Kalakota & Whinston, 1996; Laudon & Traver, 2004; Schneider, 2006). Of these, the B2C domain has been the most widely researched (Wareham *et al.*, 2005), possibly because it has proliferated in a variety of e-Commerce business models. Table 2.2 summarises the common B2C models that are in use today.

Table 2.2/...

[3] The rapid pace at which the Internet has been adopted is apparent if one notes Anghern's comment in 1997 about the Virtual Transaction Space: "*...the Internet has not yet been extensively used as a transaction space, mainly because of its underdeveloped legal, security and reliability aspects*" (Angehrn, 1997:363). Angehrn underestimated the rate at which the Internet would proliferate in the business world.

Table 2.2: B2C business models
(Sources: Timmers, 1998; Laudon & Traver, 2004)

B2C Business Model	Examples	Description
Portal	Yahoo.com, ananzi.co.za	Offers an integrated package of content services and content-search, news, email, chat, music downloads, etc.
E-Tailor	Amazon.com, cybercellar.co.za	Online version of a retail store, where customers can shop at any hour of the day or night.
Content Provider	CNN.com Mg.co.za	Information and entertainment providers like newspapers, sports sites and other online sources that offer customers up-to-date news, and special interest groups how-to guidance, tips, information, and sales.
Transaction Broker	E-Trade.com Travelocity.com	Processors of online sales transactions, such as stock brokers and travel agents, that increase customers' productivity by helping them get things done faster and more cheaply.
Market Creator	Ebay.com BidOrBuy.co.za	Web-based businesses that use Internet technology to create markets that bring buyers and sellers together.
Service Provider	Lawinfo.com Mybconsulting.com	Companies that make money by selling users a service, rather than a tangible product.
Virtual Community Provider	Ivillage.com About.com	Sites where individuals with particular interests, hobbies, and common experiences can come together and compare notes.

The various B2C models described above are representative of a new paradigm in the world of retailing. Oz (2002) describes this paradigm as the third wave of retailing. In using the grocery market as an example (refer to Figure 2.2), Oz (2002) describes how in the B2C E-Tailor model, customers do not have any intimate or personal relationships with the retailer.

Figure 2.2/...

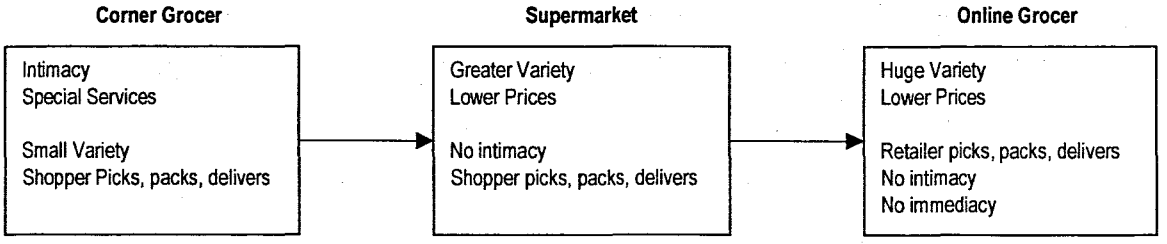

Figure 2.2: Retail waves in the grocery market
(Source: Oz, 2002:146)

Oz (2002) advises online retailers to understand the limits of intimacy and immediacy in order to succeed with e-Commerce. He suggests that customers could be compensated for the lack of intimacy by using IS as a lever to offer customers benefits such as lower prices, excellent service, and quick delivery. IS is therefore one of the key resources on which the success of the e-Commerce business model depends.

Porter (2001:73) postulates that Internet business models *"seem to refer to a loose conception of how a company does business and generates revenues"* and that *"the business model approach to management becomes an invitation for faulty thinking and self-delusion"*. Porter's assertion is supported by Magretta & Stone (2002), who posits that the term "business model" was used so often during the Internet boom to give legitimacy to bad business ideas, that the concept itself has been somewhat discredited. This may be attributed to the large number of e-Commerce failures during the e-Bubble era. The question that arises therefore, is whether these business failures could be attributed to poorly conceived business models, unsatisfactory IS, or a combination of both?

2.4 E-Commerce Information Systems (ECIS)

There are a number of different systems that are required to support e-Commerce. This includes Web-based Information Systems (WIS), which are systems developed using Web technology such as

hypermedia, XML and active server pages (ASP), as well as conventional IS such as databases, transaction processing systems and management information systems. E-Commerce businesses use WIS integrated with conventional IS (Isakowitz at al., 1998:79). In this study, the term *e-Commerce Information Systems (ECIS)* is used to refer to this collective of WIS and conventional IS. Some of the common ECIS used by e-Commerce businesses are database management systems, order management systems, shopping cart systems, web content-management systems, e-mail management systems, electronic payment systems, financial management systems, and logistics management systems (Chaffey, 2002; Schneider, 2006).

The management of ECIS is not without unique challenges as they are considered to be different from IS used in brick and mortar businesses, in terms of their scope and focus (Zwass, 1996; Garrity *et al.*, 2005). One issue, for example, is that e-Commerce businesses do not always have full control over the systems they have to use, as they also rely on IS that are developed by suppliers and intermediaries (Wang, 2001). Notwithstanding the various ECIS management challenges, the need for reliable ECIS in the e-Commerce environment is self-evident. This is appropriately summed up by Porter (2001:64), who proposes *"the key question is not whether to deploy Internet technology...but how to deploy it"*. The success of ECIS is therefore an important concern for e-Commerce managers. Since the advent of e-Commerce in the 1990s the interest in IS Success has gained prominence on the IS research agenda. When the e-Bubble burst, this interest intensified. In this period it was realised that large sums of money were being spent on ICT but with little evidence of e-Commerce success.

2.5 A history of the evolving impact of IS on business: from *Automate* beginnings to the *Transfigurate* era

The interest of researchers and business managers in the success of IS has been evolving since the first commercial deployment of computers. The history of how IS has impacted on business over the years, provides an important backdrop to the importance of this topic in the current Internet-dominated era.

Since the development of the first commercial computer in 1952,[4] the deployment of IS has significantly altered the world of business. This can be attributed to the soaring power and declining costs of computer technology.[5] The growth in investment in IS in the latter half of the twentieth century increased concerns of executives managing these resources (Hart *et al.*, 2004). Much of the concern had to do with the benefits that were associated with IS. Managers had to justify the costs associated with IS, and thus questions pertaining to its success and the evaluation of its benefits came to the fore of the research agenda.

There are three phases that describe how our interest in IS Success has evolved over the years. These can be mapped against three distinct eras of IS application in business. Laudon and Laudon (2000:15-16) describe the evolution of these eras:

> *"In the 1950s the effects of IS on organisations brought about merely technical changes, only serving to automate clerical procedures. During the 1960s and 1970s IS had an impact on managerial control, and from the 1980s onwards IS impacted upon core institutional activities such as products, markets, suppliers and customers."*

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[4] Although the history of computers indicates earlier inventions such as the Z1 Computer in 1936, the Harvard Mark I in 1944, and the ENIAC in 1946, the earliest indications of commercial activity can be attributed to the use of the UNIVAC which was used in 1952 to predict the outcome of the US elections.

[5] This is sometimes referred to as Moore's Law which, named after one of the founders of Intel, stated that semiconductor price/performance would double every two years (Willcocks & Graeser, 2001:195).

Zuboff (1988) labelled these phases as Automate, Informate and Transformate, and they are described as follows:

- *Automate phase*: focused on measurement of technical aspects of IT.
- *Informate phase*: also focused on technical aspects but with a shift towards evaluating the measurement of IS production or IS project management.
- *Transformate phase*: focused on measurement of business benefits with a shift towards a service perspective.

The Transformate era still reflects the impact of IS on organisations today. However, in considering the impact of the Internet on the business world, it is clear that organisations are going through a special kind of transformation. The Internet has a far-reaching impact on the way in which IS are being applied by businesses. The current era can therefore be thought of as being one of spectacular change or transformation. The term *Transfigurate* therefore more aptly describes the current Internet-dominant era, which is characterised by businesses that operate as global, Internetworked enterprises. Figure 2.3 summarises the salient aspects of IS benefits and measurement over the years in terms of the Automate, Informate, Transformate and Transfigurate eras.

Figure 2.3 /...

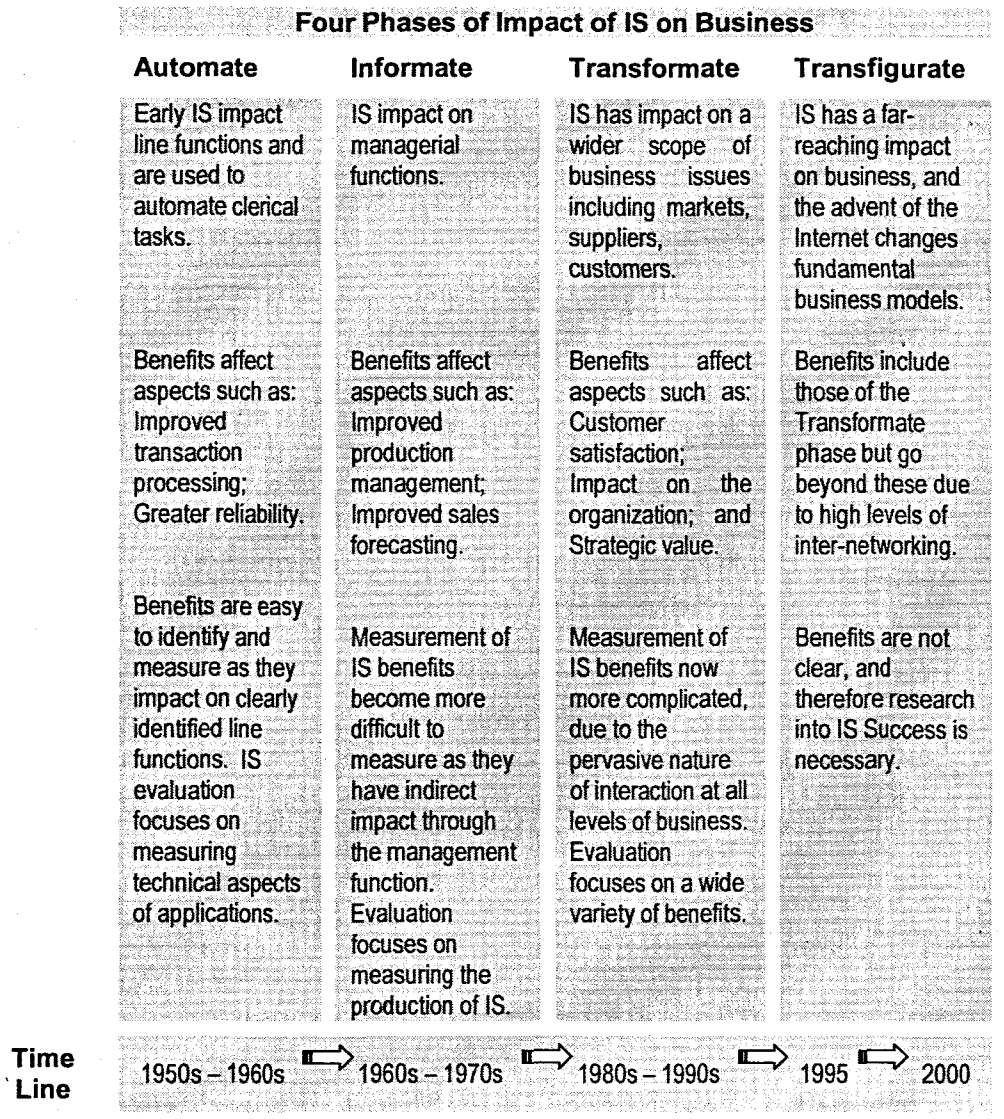

Figure 2.3: Evolvement of IS benefits from the Informate phase to the Transfigurate phase

The four phases described in Figure 2.3 can also be mapped onto the model developed by Scott Morton in 1991. During a study at the Massachusetts Institute of Technology (referred to as the Management in the 1990s or MIT90s study), a five-layer model that positioned IS at either an *evolutionary* or *revolutionary* level was developed (Scott Morton, 1991). The evolutionary level can be considered as the equivalent of systems that were characteristic of the Automate and Transformate eras, while the revolutionary level corresponds to systems in the Transformate and Transfigurate eras (Figure 2.4). The MIT90s

study brought about a change in the way IS was perceived, i.e., not as something in its own right but as a major facilitator of change to business processes (Bannister *et al.*, 2006). Although the MIT90s model was developed fifteen years ago, the fourth and fifth layers of the model, especially, are relevant to e-Commerce businesses today. Both business network redesign and business scope redefinition are characteristic of IS-related practice of e-Commerce businesses.

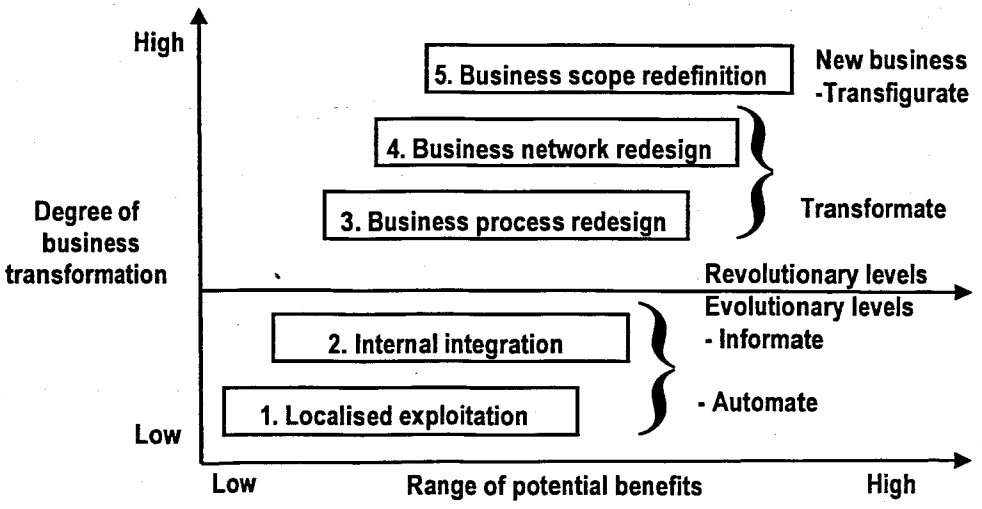

Figure 2.4: Automate, Informate, Transformate & Transfigurate mapped against the MIT90s model
(Adapted from: Scott Morton, 1991)

Given the high investment in IS in the Transfigurate era, which has been catalysed by the commercial adoption of the Internet, it is timeous to review the various approaches that have been used over the years to evaluate IS Success. This necessitates a re-examination of the literature on IS Success through a new set of lenses, which takes into account the potential of IS to radically transform the modern inter-networked business.

2.6 Contextualising IS Success

The study of IS Success is not new, with papers dating back almost four decades, e.g., Boyd and Carson (1963), Gallagher (1974) and Lucas (1973). These studies were underpinned by a concern regarding whether the technology was being used in a successful manner. In determining what constitutes IS Success, researchers have employed a number of perspectives. These range from relatively simple accounting measures to multi-dimensional balanced score-card type metrics (Bannister *et al.*, 2006).

In the post- e-Bubble era, business managers are now focused on how to gain optimal benefit from ECIS, and as such require appropriate performance metrics to evaluate ECIS Success (Barnes & Hinton, 2004). In the quest to develop ECIS success measures, researchers have argued that "*the unique characteristics underlying the Web may in some cases require new metrics or at least the careful evaluation of existing ones*" (Straub *et al.*, 2002:117).

2.6.1 IS Success

Farhoomand and Drury (1996) define IS Success as the extent to which a system achieves the goal for which it was designed. For an IS to achieve the outcomes desired by a business, it should in the first instance be functional. In other words, as a product of systems analysis, systems design, and systems building activities, it is required to be in working order, i.e., there should not be a substantive number of bugs in the software, the system should produce timely and accurate information, the transmission of data over networks should occur without error, users should be satisfied with the outputs of the systems, etc. Consequently one view of IS Success is concerned with the functionality of the IS (Beynon-Davies *et al.*, 2004). From this point of view, researchers have studied IS as a product (Whyte & Bytheway, 1996;

Lomerson & Tuten, 2005), as well as the processes involved in developing the system (Saleh & Alshawi, 2005).

However, having an operational IS is only one aspect of success. Another view focuses on the benefits that accrue to a business post-implementation of the system (Farbey *et al.*, 1993). One of the important benefits expected from IS implementation is that of a positive financial return. However, not all benefits are tangible or easily susceptible to financial quantification (Willcocks & Graeser, 2001). There are several intangible benefits attributed to IS such as improved customer service, improved responsiveness, increased agility, enhanced quality of working life, etc. (Farbey *et al.*, 1993). Although intangible, these constitute benefits for the business as well and as such ought also to be acknowledged as indicators of the success of IS.[6]

Based on the foregoing discussion, IS Success, in the context of this study, is defined as follows:

> *A successful IS favourably accomplishes the aims which underpin its conceptualisation and design. In a business context this implies that it should be able to consistently fulfil the business goals and objectives for which it was designed or purchased. Furthermore, a successful IS facilitates the accrual of both tangible and intangible benefits to the business.*

2.6.2 Positioning the IS Success literature within a framework

The three views of success discussed in the preceding section have resulted in a plethora of ideas concerning IS Success and evaluation.[7] As a result, there are various ways in which the literature could be

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[6] IS benefits are discussed in further detail in Section 2.8.

[7] Refer to DeLone and McLean (1992, 2003), Berghout and Remenyi (2005), for a synopsis of the divergent methods and approaches taken by researchers in this field.

categorised. Lee and Kozar (2006) aver that this field of study is divided into two categories. The first is concerned with how to develop *methods* for evaluating IS and IS benefits (e.g., Smithson & Hirscheim, 1998; Irani & Love, 2002; Mcaulay *et al.*, 2002), and the second is to identify *factors* affecting IS Success (e.g., Seddon *et al.*, 1999; DeLone & McLean, 1992). Studies that focus on methods, according to Saleh and Alshawi (2005), can be categorised according to the focus of the evaluation, viz., evaluating an IS as a product of systems development (e.g., system quality, system use, user satisfaction), or evaluating the processes which underpin the development of IS (e.g., goal-centred, comparative, improvement, normative).

In addition to the above, the literature has also focused on methods for identifying and quantifying the benefits of IS (Remenyi *et al.*, 2000). The point at which IS evaluation is carried out has a bearing on the methods that are used (Farbey *et al.*, 1999). Traditionally evaluation has occurred at two stages. Firstly, during the feasibility study (ex-ante evaluation), where forecasts are made of the impact of the new system, and secondly, a post-implementation evaluation (ex-post evaluation) after the system has been commissioned, to measure the actual impact (Smithson & Hirscheim, 1998). There are other suggestions that IS evaluation should be conducted a number of times during a project's life cycle (Remenyi *et al.*, 2000). This includes evaluation during system planning, at the completion of design, after implementation, and during regular routine operations.

Using the foregoing discussion as a basis, the high-level phases of the systems development life cycle (SDLC) can be used as a basis of organising the extant IS Success literature into three streams (Figure 2.5) as follows:

- Firstly, there are studies that have focused on forecasting and evaluating the potential success or future impact of IS. In addition to

this, research has also been conducted on evaluating the methods used when developing IS (Box A).

- Secondly, other studies have examined the success of IS in a post-implementation perspective, i.e., success as a product of systems development. The main premise of these studies is to determine if the IS in use is achieving the desired outcomes for which it was designed or purchased (Box B).
- Thirdly, there are a number of studies that have focused on evaluating IS benefits. The assumption of these studies is that the primary purpose of IS implementation is to bring about some added value or benefits to the business. From this perspective, there are a number of papers that have investigated methods of identifying and evaluating such benefits or value in the post-implementation phase. (Box C).

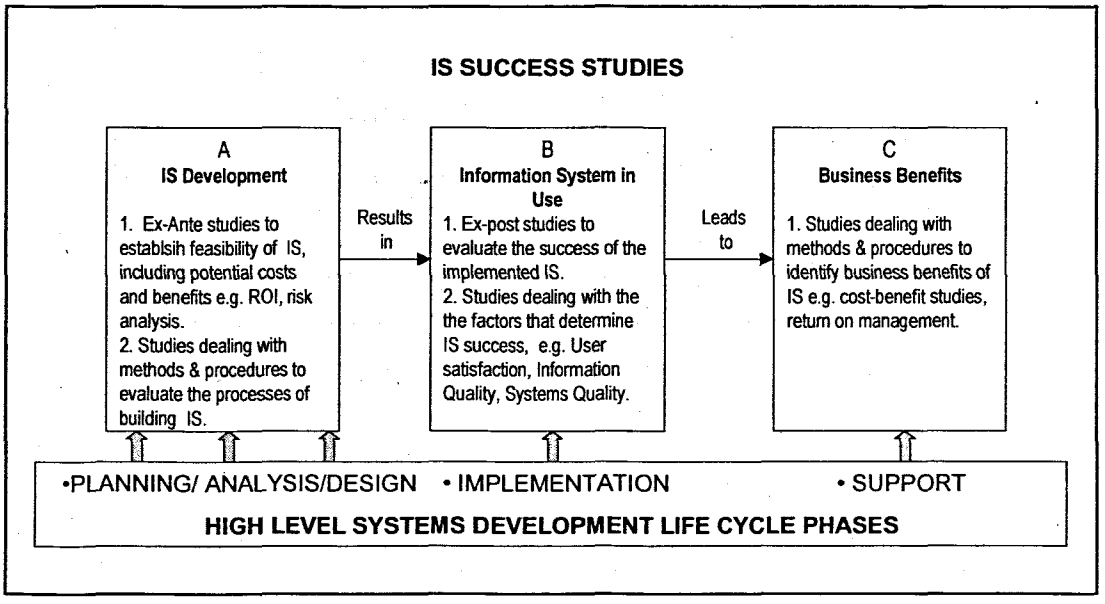

Figure 2.5: IS Success studies mapped against the SDLC

From the foregoing discussion three areas of IS Success have been highlighted, viz., (1) Indicators of successful development of the IS; (2) Indicators of a successful product, from an operational perspective; and (3) Indicators of positive business benefits.

2.6.3 The scope of IS Success in the context of this study

This study addresses the e-Commerce business environment, and the research questions are directed at identifying the factors that affect IS Success in B2C e-Commerce organisations. Given the foregoing discussion of the scope of the broader body of literature, Figure 2.6 below demarcates IS Success within the context of this study. This figure shows that the scope of the research questions locates this study in a post-implementation, business operational perspective.

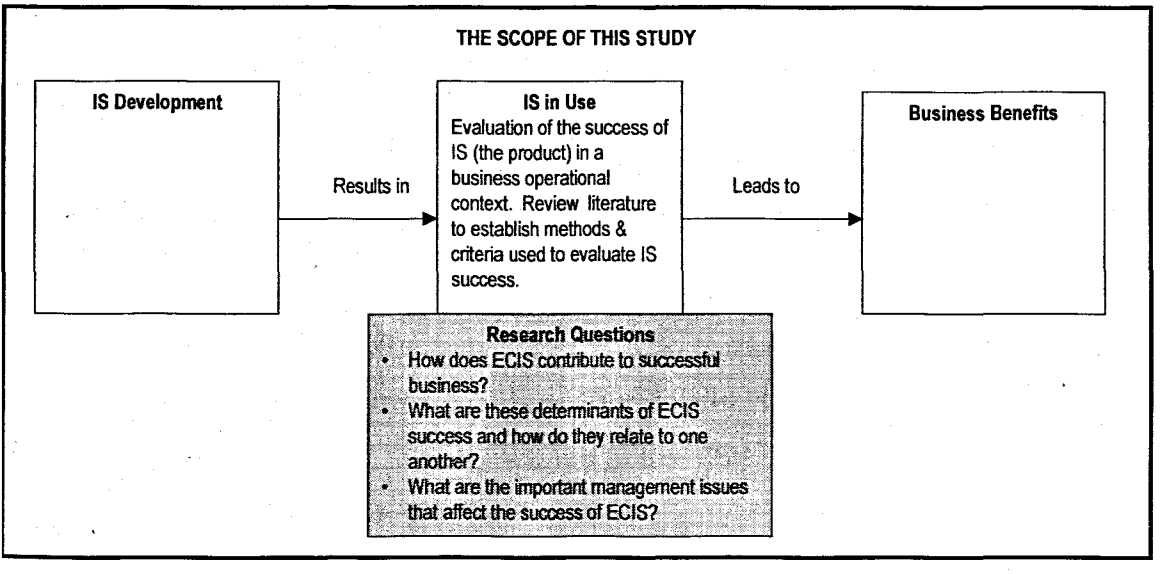

Figure 2.6: The context of IS Success within the scope of this study

Following on Figure 2.6, the remainder of the literature review will focus mainly on studies that have examined the factors affecting IS Success, and the methods used to evaluate the success of the IS as product of systems development (refer to Box B of Figure 2.5). Additionally, so as to present a more comprehensive background to this topic, the discussion on IS Success factors, is preceded by a brief introspection of the reasons that motivate business managers' interest in this field as well as the approaches to evaluating IS benefits (refer to Box A and C of Figure 2.5).

2.7 The business manager's interest in IS Success

When managers engage in control activities, they establish performance standards and develop mechanisms for gathering performance information in order to assess the degree to which standards are being met (Lewis *et al.*, 2004). Koontz and Weihrich (1988) describe control as the act of measuring performance against goals and plans, in order to identify where negative deviations exist, and to put in motion actions leading to corrective measures. Wiggers *et al.* (2004:15) describe the planning and control cycle as follows:

> *"Based on the goals and the objectives of the managed unit, the activities need to be planned. For the execution of this planning all kinds of resources are used. In order to know whether the execution of the activities develops according to plan, this execution needs to be measured. After the analysis of the measurements, the management can change the planning, add more resources, etc."*

The questions what to measure and how to measure, i.e., the evaluation activities, therefore become fundamental to the control activity of management. Following on this, it is clear that in the first instance, the interest in IS Success stems from a requirement of managers to fulfil their duties by carrying out core management functions, in particular that of control (Serafeimidis & Smithson, 1999). It is worthwhile noting that the activities involved in evaluating IS Success, are the joint responsibility of both IS and business managers (Kohli *et al*, 2003).

The second, and perhaps far more important reason for assessing IS Success, is the high expenditure on IS infrastructure. With high expenditures on IS, it is therefore incumbent upon managers to be able to not only justify the expenditure when initiating new projects, but also to gauge the value that the business derives from IS. One of the reasons that the evaluation of IS Success is complicated and problematic is because there has been much speculation regarding exactly how value is gained from IS investments.

Despite widespread investment in IS, many academic researchers and industrial practitioners have questioned whether or not such investment adds value to organisations (Whyte *et al.*, 1997; Seddon, *et al.*, 1999; Lomerson & Tuten, 2005). In reference to investments in IS, Cotteleer (2004:2) asks:

> *"So how do we reconcile the demand on the part of firms, executives and shareholders to present a valid business case with the reality that almost no one believes the* [value derived from the] *work product that is eventually delivered?"*

The questions around IS value gained much attention when the Nobel Laureate economist Robert Solow characterised the computer age by saying that *"we see computers everywhere except in the productivity statistics"* (Solow,1987). This anomaly became known as the productivity paradox of information technology (Brynjolfsson, 1993). The view posited by Brynjolfsson was that although large sums were being invested in IS, there was no apparent increase in the productivity statistics. There were various reasons offered to explain this paradox, such as the "*deficiencies in* [the] *measurement and methodological toolkit*" and the "*mismeasurement of outputs and inputs*" (Brynjolfsson, 1993:66). The paradox problem was further compounded recently by Carr (2003), who suggests that IS has lost its capacity to offer competitive advantage. Over the years there have been a number of studies that supported the existence of a productivity paradox, e.g., Strassmann (1990), Atkinson and Court (1998) and Kohli *et al.* (2003). However, in 1996, Brynjolffson and Hitt revisited the problem, and concluded that IS spending did indeed result in high returns (Brynjolffson & Hitt, 1996; Hitt & Brynjolffson, 1996). Thus a third reason that motivates business management's interest in IS Success is to ensure that their investments yield appropriate returns in the form of increased productivity.

In summary, three reasons have been identified to support the interest in IS Success research:

- Firstly, evaluation is one of four key management activities, and given the pervasive nature of IS in organisations today, it is not possible for managers to fulfil their duties if they ignore issues related to IS Success.
- Secondly, given the ever-increasing investments in IS, managers are duty-bound to justify such expenditure. Clearly formulated evaluation plans will assist in making such justifications.
- Thirdly, there has been speculation regarding how IS adds value to organisations. Further research regarding how IS Success should be evaluated will continue to uphold the view that IS investment does contribute towards increased productivity, as well as competitive advantage.

2.8 Evaluating IS Success: value, benefits, and financial approaches

There are various perceptions of the value that businesses derive from IS. The value placed in IS is seen to become higher as the use of IS in the organisation progresses from being just a facility to that of an enabler. Wiggers *et al.* (2004:5) use the *IT Value Perception Model* (Figure 2.7) to describe how managers perceive value, as follows:

> *"The maturity of IT supply deals with the professionalism and quality of the IT function in the organisation, with maturity being measured using a quality model such as the Capability Maturity Model (CMM). Maturity of IT demand refers to the self-awareness and self-consciousness of businesses to use and demand an appropriate level of quality from their IT supportive organisations. The IT value perception describes the perception of the executive management of the added value that IT delivers to the company".*

Figure 2.7/...

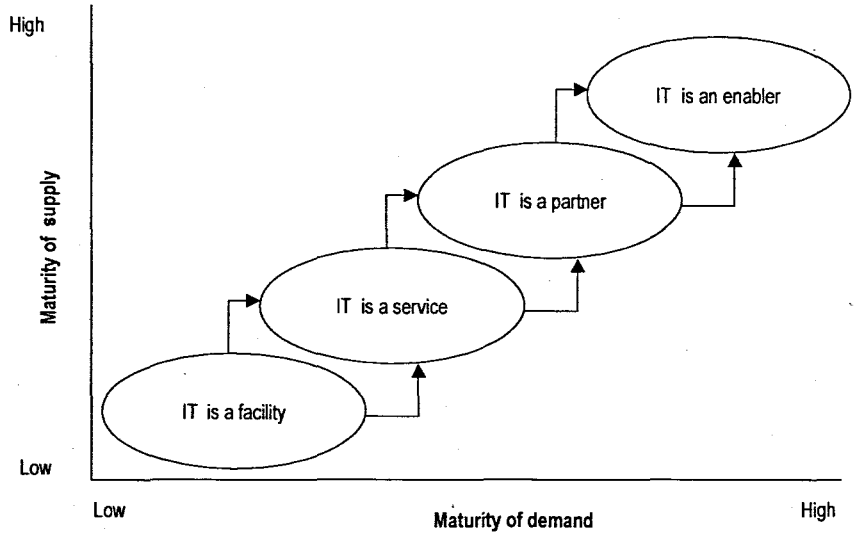

Figure 2.7: The IT Value Perception Model
(Source: Wiggers *et al.*, 2004: 4)

Over the years a number of approaches have been proposed to determine the value derived from IS. As described in Section 2.6, one component of the IS Success literature concerns evaluating benefits. There are a number of generic forms of IS benefits which can be categorised as strategic, management, operational, functional and support (refer to Figure 2.8).

Figure 2.8/...

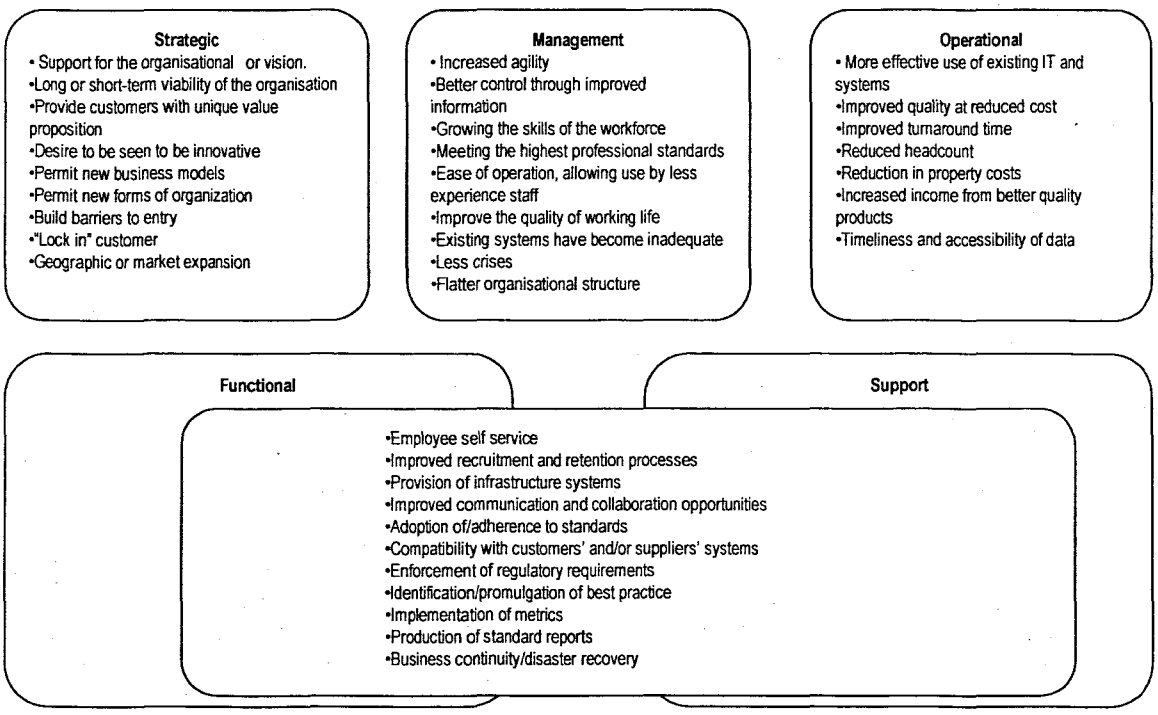

Figure 2.8: Generic forms of benefits arising from IS/IT
Source: Ward and Daniel (2006: 8)

In the discussion that follows, benefits are described as being either tangible or intangible. An overview is also presented of financial approaches to IS evaluation, in order to contrast this with other non-financial approaches discussed in subsequent sections.

2.8.1 Tangible and intangible benefits

The implementation of IS can result in a variety of benefits, some tangible, some intangible and even some unexpected benefits (Kohli *et al.*, 2003). A tangible benefit is one which directly affects the firm's profitability, whereas an intangible benefit is one which can be seen to have a positive effect on the firm's business, but does not necessarily influence the firm's profitability directly (Remenyi *et al.*, 2000). Table 2.3 contrasts tangible and intangible IS benefits.

Table 2.3/...

Table 2.3: Examples of Tangible and Intangible IS benefits
(Adapted from: Remeny *et al.*, 2000: 29-30, 152-153)

IS Benefits	**Tangible** (*Directly affects firm's profitability*)	**Intangible** (*Has no direct affect on profitability*)
Quantifiable (can be measured)	May be objectively measured; e.g. increase in revenue; reduction in costs	Difficult to measure objectively e.g. obtaining information faster; improved customer satisfaction
Unquantifiable (cannot be measured or more difficult to measure)	Precise impact on profitability cannot be measured, e.g. better information; improved security	Difficult to put a financial value to the benefit, e.g. increased customer confidence; customers or employees" perception of the firms product.

From Table 2.3, we observe that benefits can be categorised according to the degree to which they may be quantifiable. However, there are several examples of both tangible and intangible benefits that are difficult to quantify.

Hitt and Brynjolffson (1996) posit that the question of IS value is not a single one, but rather consists of several related but distinct issues. These are represented by the key questions around IS value, viz., have investments in IS

- increased productivity, i.e., is there now more output per given quantity of input?
- improved business profitability, i.e., has the business been able to use IS to gain competitive advantage and earn higher profits than it would have earned otherwise?
- created value for consumers, i.e., what is the magnitude of benefits that have been passed on to the consumers?

The foregoing are examples of some of the fundamental questions that underpin our understanding of IS Success. The complexity of these approaches is dictated by the extent of the tangibility of the benefits, as well as the ease of measurement.

2.8.2 *Using financial measures to evaluate IS benefits*

Financial benefits are tangible and quantifiable. IS investments are often justified using financial measures. Examples of such approaches, according to Bills (2004), are Return on Investment (ROI), Net Present Value (NPV), Economic Value Added (EVA) and Real Option Valuation (ROV). These approaches essentially employ mathematical and statistical formulae to determine the potential financial returns from IS implementation.

There are also many financial measures that are used in the post-implementation phase (ex-post evaluation) which focus on evaluating the financial value of the business benefits that are attributed to IS. The main principle behind these approaches is that if the IS has resulted in benefits that can be attributed to high financial return, then the system can be considered as having been successful. Examples of benefits that have been investigated in ex-post IS evaluation studies are: sales revenue, labour productivity (Hitt & Brynjolfsson, 1996; Koski, 1999); profitability (Markus & Soh, 1993; Stoneman & Kwon, 1996); growth in revenues (Mahmood & Mann, 1993); and total costs to the business (Whelan & McGrath, 2002).

Aitken (2003) reports that 89% of companies have virtually no metrics in place except for finance. This is because these measures are attributed to benefits that are both easy to identify and measure using quantitative techniques. Some examples of financial benefits illustrated by Remenyi *et al.* (2000) are improved productivity, improved cash flow, and reduced bad debts.

2.9 IS Success: non-financial approaches

Although financially-based approaches to determining IS Success have been widely adopted, many companies are now finding this to be limiting

(Ward & Daniel, 2006:30). The use of financial measures only, has been criticised for not adequately addressing IS evaluation concerns (Irani & Love, 2002; Love *et al.*, 2004). For example, Kumar (2004) observes that traditional financial evaluation techniques undervalue IS since they do not carefully consider relatively intangible benefits such as satisfaction of users. There is therefore a growing consensus amongst academics that the traditional view of financially driven, measurement-oriented evaluation, should be replaced by a form of evaluation that addresses a wider range of benefits (Doherty & McAuly, 2002). To this end, there have been various approaches to the evaluation of IS Success from non-financial perspectives.

The use of non-financial approaches does not imply that the measurement of financial benefits is not important. Rather, in addition to measuring financial benefits, there is also merit in evaluating how successful the IS is in terms of its ability to support the business objectives for which it was conceived, designed and implemented. Such studies have investigated aspects of the technical quality of the system, e.g., response time (Conklin *et al.*, 1982; Srnivasan, 1985) and software architecture (e.g., Dobrica & Niemelä, 2002; Hamalainen *et al.*, 2005). However, from an early stage, it has been noted that direct measures of assessing IS Success are difficult to develop (Galletta & Lederer, 1989). Therefore many researchers have identified surrogate measures that indirectly assess IS Success through the measurement of constructs such as user satisfaction (e.g. Bailey and Pearson 1983, Remenyi & Money, 1991; Hughes & Cooper, 2002; Shaw *et al.*, 2002), and extent of system usage (e.g., Mahmood & Medewitz, 1985; Srinivasan, 1985; Trice & Treacy, 1986; Gelderman, 1998).

Researchers, however, have found empirical results in this area to be inconsistent, with a lack of overall synthesis across the numerous approaches to IS Success evaluation (Rai *et al.*, 2002; Sabherwal, *et al.*, 2004). This inconsistency and diversity in approaches led to a number of

attempts to bring about some coherence to the field by developing classifications of IS Success measures. The findings of four such studies are summarised in Table 2.4.

Table 2.4: Various classifications of IS Success measures

Source	Classifications of IS Success measures
Zmud (1979)	▪ User performance ▪ User satisfaction
Ives & Olson (1984)	▪ System Quality ▪ System acceptance: o system usage, system impact on user behaviour, information satisfaction
DeLone & McLean (1992)	▪ System Quality ▪ Information Quality ▪ System Use ▪ User Satisfaction ▪ Individual Impact ▪ Organisational Impact
DeLone & McLean (2003)	▪ System Quality ▪ Information Quality ▪ Service Quality ▪ Intention to Use ▪ Use ▪ User Satisfaction ▪ Net Benefits
Saberwal, *et al.* (2004)	▪ Contextual Factors: o Top Management Support, IS Facilitating Conditions; Quality of ISD Team ▪ User Related Factors: o User IS experience, User attitude, User participation ▪ System success o System Quality, Perceived Usefulness, User Satisfaction, System Usage

Of the studies listed in Table 2.4 the one by Delone and McLean (1992) has received much attention in the literature. The main output of this particular study, the IS Success Model, has been regarded by many authors, e.g., Molla and Licker (2001), as a major contribution and has been the focus of several investigations since 1992.

2.10 IS Success models

In an extensive review of 180 empirical studies, Delone and McLean (1992:61), concluded that *"there are as many IS Success measures, as there are studies"*. This prompted these authors to develop a more integrated view of the concepts of success. This resulted in the IS Success Model (Figure 2.9), which is described as a "*taxonomy of IS success measures*" with a number of inter-relationships that are drawn together in a model of six major "*dimensions or categories of IS success*" (Delone & McLean, 1992: 60-61).

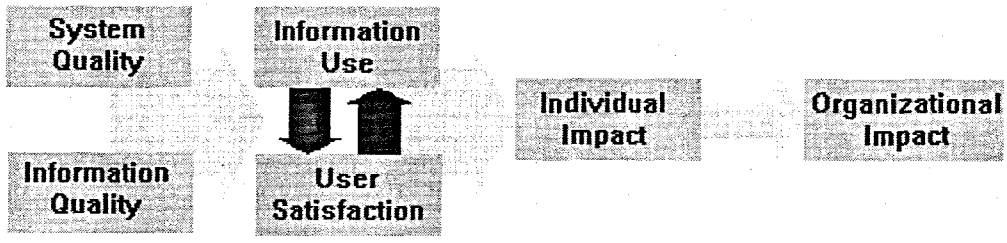

Figure 2.9: IS Success Model
(Source: Delone & McLean, 1992:87)

An interpretation of the model is as follows:

> *"System Quality and Information Quality singularly and jointly affect both Use and User Satisfaction. Additionally, the amount of Use can affect the degree of User Satisfaction. Use and User Satisfaction are direct antecedents of Individual Impact; and this Impact on individual performance should eventually have some Organizational Impact"*
>
> (Delone & McLean, 1992: 83-87).

Some of the important conclusions drawn by DeLone and McLean (1992: 87-88) were:

- the multidimensional and interdependent nature of IS Success requires careful attention with regard to the definition and measurement of each aspect of the dependent variable, IS Success;

- the selection of success dimensions and measures should be contingent on the objectives of the empirical investigation; and
- despite the multidimensional and contingent nature of IS Success, an attempt should be made by researchers to reduce significantly the number of different measures used to measure IS Success.

Since the publishing of the IS Success Model, it has been subjected to various challenges (e.g., Seddon, 1997), affirmations (e.g., Seddon & Kiew, 1996; Rai *et al.*, 2002), and tests (e.g., Goodhue & Thompson, 1995; Etezadi-Amoli & Farhoomand, 1996; Igbaria & Tan,1997; Roldàn & Leal, 2003). In the period 1992 to 2003, nearly 300 articles in refereed journals have cited and critiqued the IS Success Model (DeLone & McLean, 2003:10). This is indicative of the importance attributed to this model by the IS academic community. The IS Success Model is also used by the Association of Information Systems' (AIS) special interest group for IS Effectiveness. It appears on their website[8] as a framework for organising an online repository of material on IS Success.

2.10.1 Process versus variance models

One important challenge to the IS Success Model, concerned the combining of a process and variance model (Seddon, 1997). Markus and Soh (1993) posit that although variance theories excel at explaining variations in the magnitude of a certain outcome, they tend not to do well in situations where the outcome is uncertain. In contrast, process theories can provide powerful explanations even when causal agents cannot be demonstrated to be sufficient for the outcome to occur. Seddon's viewpoint is that the boxes and arrows in variance and process models represent quite different concepts and cannot be combined meaningfully in one model, and thus the IS Success Model was problematic in this regard. He further posits that the inclusion of both

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[8] See http://www.ais.org

variance and process interpretations in the IS Success Model "*leads to many potentially confusing meanings*" (Seddon, 1997:240). Table 2.5 contrasts process with variance theories.

Table 2.5: Differences between variance theories and process theories
(Source: Markus & Soh, 1993:31)

Characteristic	Variance Theory	Process Theory
Outcome	A variable	A discrete occurrence
Logical form	If X (independent variable, necessary and sufficient conditions), then Y (dependent variable); if more X, then more Y.	If not-X (necessary conditions), then not-Y (outcome);cannot be extended to "more X" or "more Y".
Assumptions	Outcome will invariably occur when necessary and sufficient conditions are present.	Outcomes may not occur even when conditions are present unless a particular "recipe" involving external directional forces and probabilistic processes unfolds.
Role of time	Irrelevant; necessary and sufficient conditions can occur in any order.	Crucial; the time ordering in which necessary conditions combine is consequential.
How to "read" the theory	The cause is necessary and sufficient to produce the effect.	Causation consists of necessary conditions occurring in a particular sequence in which change and random events play a role.

In response to this criticism, DeLone and McLean (2003:16) argue that it is possible to combine both process and variance dimensions into one model. They explain that as a process model there are three components of the IS Success Model, viz., the creation of a system, the use of the system, and the consequences of the system use. However, each of these steps is a necessary but not sufficient condition for the resultant outcomes, e.g., without system use, there can be no consequences or benefits. As a variance model, there are three components of the IS Success Model, viz., production, use, and net

benefits. For example, higher system quality is expected to lead to higher user satisfaction and use, leading to positive impact on individual productivity, resulting in organisational productivity improvements (DeLone & McLean, 2003:11).

2.10.2 The unit of analysis in IS Success studies

Another important criticism of the IS Success Model concerns the unit of analysis. Seddon *et al.* (1999) argue that although there are a large number of measures in the literature, the units of analysis have received little attention. In addressing this problem, they propose a two-dimensional matrix for classifying IS Success measures. They name the first dimension as *Stakeholder,* which includes an independent observer, individual, group, management, and a country. The second dimension is called *System*, and includes the following:

- An aspect of IT use, e.g., a single algorithm or form of user interface.
- A single IT application, e.g., a spreadsheet, a cataloguing system.
- A type of IT or IT application, e.g., TCP/IP, a GDSS, a TPS, etc.
- All IT applications used by an organisation or sub-organisation.
- An aspect of a system development methodology.
- The IT function of an organisation or sub-organisation.

(Seddon *et al*, 1999:6).

By classifying IS Success measures using these two dimensions in a two-by-two matrix, Seddon *et al.* (1999) derived 30 possible classes of measures, each representing a particular unit of analysis for an IS Success study. The importance of this study is that it brings to light how subtle differences in stakeholder perspectives can produce significantly different evaluations of systems. The study therefore adds value to our understanding of how to go about evaluating by emphasising the significance of two important issues. Firstly, researchers ought to clearly identify the stakeholders in whose interest the IS evaluation is being

conducted. Secondly, the type of system being evaluated should be clearly identified and understood. These two simple, but nevertheless important perspectives, can assist researchers to more accurately define the unit of analysis of the study.

2.10.3 Updates to the IS Success Model

Given the widespread use of the IS Success Model in a number of different studies since 1992, an update to the model (Figure 2.10), was recently proposed. Important modifications to the initial model included:

- The *Quality* construct of IS Success was extended to include *Service Quality.*
- The construct *Systems Use* was found to be multi-dimensional, e.g., mandatory versus voluntary use. As a result, *Intention to Use* was added to the model, to differentiate between *Systems Use* as a behaviour as opposed to *Intention to Use* as an attitude.
- The constructs of *Individual Impact* and *Organisational Impact* were collapsed into a single dimension named *Net Benefits.*

(Delone & McLean, 2003:22-23).

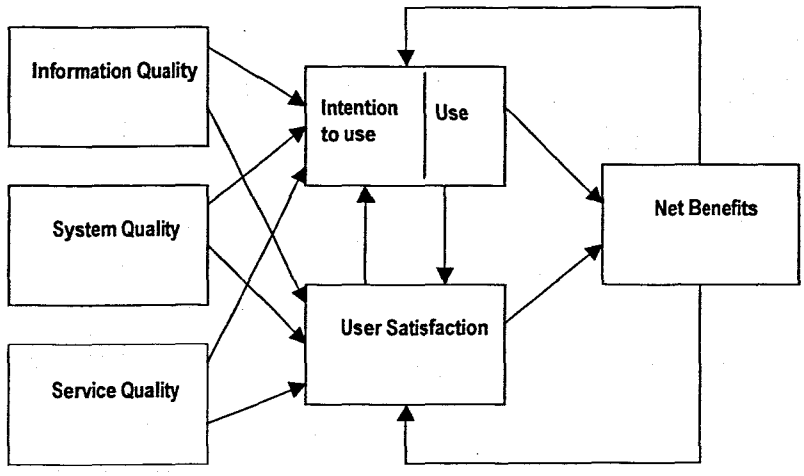

Figure 2.10: The updated IS Success Model
(Source: DeLone & McLean, 2003:24)

In addition to the improvements described above, the authors also suggest that the updated model provides *"a parsimonious framework to organise the various success metrics identified in the IS and e-commerce* literature (DeLone & McLean, 2003:25).[9]

Other models of IS Success that have been identified in the literature include the Garrity and Sanders model of IS Success (Garrity & Sanders, 1998), the Hierarchical Model of IS Success (Drury & Farhoomand, 1998), the Technology Acceptance Model (Davis, 1986), the E-Commerce Success Model (Molla & Licker, 2001), and the Web-Based Information Systems Success Model (Garrity *et al.*, 2005). However, besides the Technology Acceptance Model, all the other models have used the IS Success Model (DeLone & McLean, 1992) as an underpinning framework. This is indicative of the wide acceptance of this model. In the light of this, the IS Success Model is a useful framework to guide a discussion on some of the more common approaches to the evaluation of IS success.

2.11 The user-satisfaction dimension of IS Success

The user-satisfaction approach to IS Success has been widely published, and several standardised instruments have been developed over the years, e.g., Ives *et al.* (1983), Bailey and Pearson (1983), Baroudi and Orlikowski (1988), Doll and Torkzadeh (1988), Miller and Doyle (1987), Remenyi and Money (1991) and Shaw *et al.* (2002). The comprehensive review of literature conducted by Delone and Mclean in 1992 and 2003 (Delone & McLean, 1992; Delone & McLean, 2003) revealed that user satisfaction was the most widely used measure of IS Success. User satisfaction has also been widely used to measure IS

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[9] This proposition is explained in further detail in a subsequent paper (Delone & McLean, 2004), which specifically deals with e-Commerce and IS Success.

Success in the e-Commerce environment,[10] e.g. D'ambra and Rice (2001), Boyd (2002), Feinberg and Kadam (2002) and Kohli *et al.* (2004).

2.11.1 The origins of user-satisfaction research

User-satisfaction research can be traced back to the 1980s. Studies in this era have been synthesized into three perspectives by Kim (1989:2-3). These are user satisfaction in terms of *attitudes* (Lucas, 1973; Bailey & Pearson, 1983; Ives *et al*, 1983; Miller & Doyle, 1987); user satisfaction in terms of *information quality* (Gallagher, 1974; King & Epstein, 1983; Jenkins & Ricketts, 1985) and user satisfaction in terms of *organisational effectiveness* (Schultz & Slevin, 1975; Sanders, 1984).

The pioneering work of user satisfaction, in terms of attitudes, was produced by Bailey and Pearson (1983) with the development of a 39-item questionnaire for measuring perceived user satisfaction with IS. This was subsequently the focus of several studies such as Ives *et al.* (1983), Treacy (1985), Galletta and Lederer (1989), and Baroudi and Orlikowski (1988), which offered various critiques of the Bailey and Pearson instrument. These studies provided a strong foundation for continued research in this area. Papers, based on various adaptations of this construct, continued to be published in the 1990s up to the current era.

2.11.2 User satisfaction in e-Commerce business

None of the literature reviewed used the term "user satisfaction" as a construct for evaluating IS Success. However, terms such as "*customer*

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[10] Although the term *User satisfaction* is not used per se in the e-Commerce literature, it has been acknowledged that the online customer is simultaneously an IT-user (Koufaris, 2002). Therefore studies that have investigated customer satisfaction with websites are representative of user-satisfaction studies in the e-Commerce literature.

e-commerce satisfaction" (Molla & Licker, 2001) and "*customer satisfaction*" (Feinberg & Kadam, 2002) align closely with the user-satisfaction dimension of IS Success.

Delone and McLean (2004), in their review of the e-Commerce literature, found that there were no specific instruments for measuring user satisfaction. This is as a result of taking a narrow view of the user-satisfaction construct. Such a view is rooted within the definitions of the traditional computer end-user. A more open mind to the utilisation of the user-satisfaction dimension of IS Success is required in the e-Commerce context. This is closely related to the service quality dimension of IS Success.

2.12 Service quality: an adaptation of the user-satisfaction dimension of IS Success

Service quality can be defined as *"the difference between customers' expectations for service performance prior to the service encounter and their perceptions of the service received"* (Asubonteng *et al.*,1996:64). Gefen (2002) defines service quality as the subjective comparison that customers make between the quality of the service that they want to receive and what they actually get. Table 2.6 describes the evolvement of a service perspective in the IS Success literature.

Table 2.6/...

Table 2.6: Perspectives of IS Success
(Adapted from: Whyte & Bytheway, 1996:75-77)

THREE PERSPECTIVES OF IS SUCCESS		
PRODUCT *The product which is delivered to the users, e.g, actual software*	**PROCESS** *The process that creates the system, e.g., RAD approach, end-user approach, etc.*	**SERVICE** *Deals with softer issues, e.g,. answering questions, dealing with problems, addressing concerns of users.*
It is argued that early IS research has chosen to deal with the product viewpoint, focusing on the more tangible attributes and characteristics of systems products, such as response times, data volumes and extent of system usage.	Increased systems complexity, the increasing number of unsuccessful systems and a growing systems development backlog led to a shift in attention from the product perspective to the process viewpoint. The studies concentrated on the more tangible attributes such as the number of errors occurring within the process, the level of user involvement and the milestones at which user approval is given.	The emergence of a service perspective introduces the idea of evaluating end-users' perceptions of IS Success.

2.12.1 Background to service quality and its prominence in the IS Success literature

Kim (1991) was one of the first researchers to introduce a service perspective of IS Success. Kim's gap model (Figure 2.11), which provides a conceptual framework for user-satisfaction measurement, has its roots in consumer-satisfaction research.

Figure 2.11/...

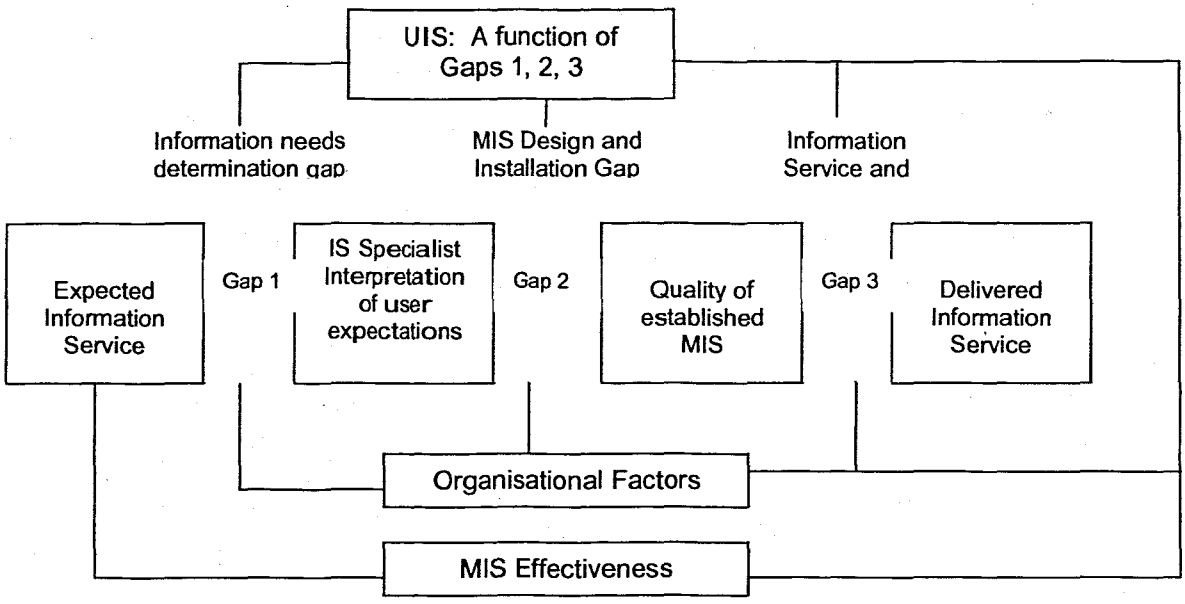

Figure 2.11: A gap model of user satisfaction
Source: (Kim, 1991:186)

The intellectual basis of Kim's model, which is derived from studies conducted by Parasuraman *et al.* (1985, 1988), is based on the SERVQUAL model. SERVQUAL uses a five-dimensional scale (Tangibles, Reliability, Responsiveness, Assurance, Empathy) to measure customers' expectations and perceptions of service quality (Parasuraman *et al.*, 1988:25). A number of investigations have attempted to refine and improve SERVQUAL (Carman, 1990; Finn & Lamb, 1991; Babakus & Mangold, 1992). SERVQUAL, which is widely cited in the marketing and retailing literature, has been applied in varying organisational settings, e.g., the car-service industry (Bouman & Van der Wiele, 1992), local government (Donnelly *et al.*, 1995), and the health sector (Curry & Sinclair, 2002).

Kim's model made an important contribution to the user-satisfaction literature in that it introduced the measurement of both user expectations and perceptions of IS service. The relevance of both expectations as well as perceptions of IS service took into account the deficiency of research into user satisfaction in the period up to the end of the 1980s (Kim, 1991: 184-185). One of the significant problems that Kim

highlighted was that prior research focused only post-implementation phenomena. He concluded that *user expectations* also play an important role in determining satisfaction.

The gap model forms the basis of the next era of user-satisfaction measuring scales. Even though there have been criticisms regarding the use of gap measurement (Cronin & Taylor, 1992; Van Dyke *et al.*, 1997), there is ample evidence to support such an approach for measuring satisfaction with IS services (Remenyi & Money, 1991; Kettinger and Lee, 1994, 1997; Pitt *et al.*, 1997; Watson *et al.*, 1998; Jiang *et al.*, 2002; Gefen, 2002).

Remenyi and Money (1991) were the first researchers to use Kim's service-oriented perspective of IS Success to design a user-satisfaction measuring instrument based on both user expectations and perceptions. The primary tenets of instruments such as this are:

- the IS function is a service function and consequently the attitudes of the user are a credible indicator of effectiveness; and
- the gap between users' expectations of the IS service, and the actual delivered service provides a basis for measuring user satisfaction.

In 1997, Pitt *et al.* proposed that the IS Success Model be adapted to include a Service Quality component. This modification was subsequently endorsed by the original authors of the IS Success Model (DeLone & McLean, 2003).

2.12.2 Service Quality: an approach to evaluating user satisfaction in the e-Commerce Environment

Service Quality research underpins a large number of studies in the e-Commerce literature. These studies address the measurement of both IS system quality (e.g., Cody & Hope, 1999; Chang & King, 2005) as

well as the general use of the website (e.g., Zeithaml, 2002; Lee & Lin, 2005; Parasuraman *et al.*, 2005). In the case of the latter, most of the studies deal with how effectively service quality is delivered through the website. Thus from the point of view of the IS Success Model, service quality research can be categorised under the IS Success dimension of *use*, as well as user satisfaction.

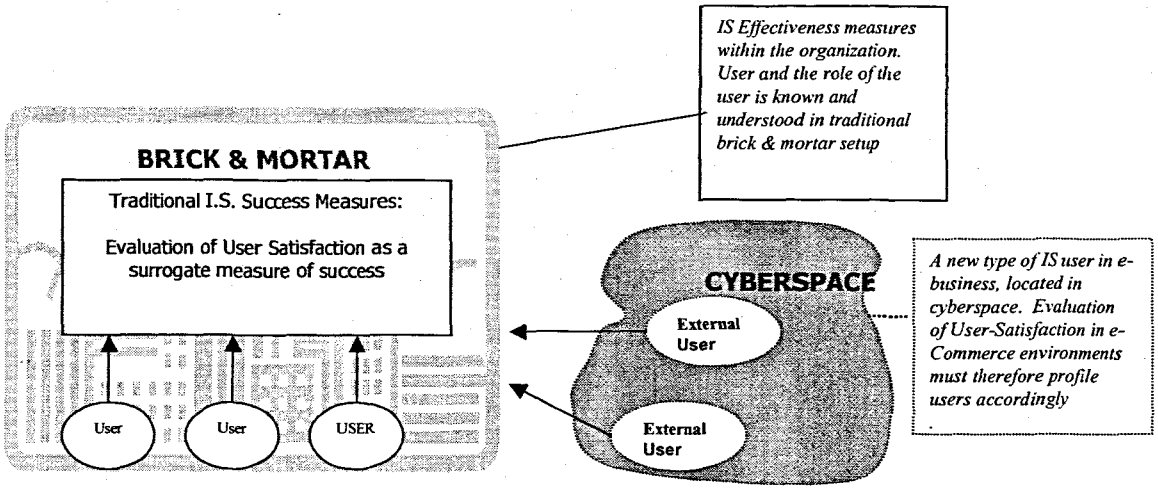

Figure 2.12: The evolvement of a new type of end-user in e-Commerce

A distinct feature of the e-Commerce environment is that the characteristics of the traditional end user of IS have changed considerably. According to Cheon *et al.* (1993), the variables *Use* and *User satisfaction* have been located in traditional research models within the brick and mortar organisational environment. Within this environment, the role of the end user of IS has evolved in a manner in keeping with the changing nature of computing. With the advent of e-Commerce, users of IS are now located out of the physical domain of the business (Figure 2.12). These IS users are different in the sense that they are not performing a role within the organisation, but are merely interacting with the business through its website, with the possible intention to conduct a transaction. In the light of this, Han and Han (2001) conclude that previous research on user satisfaction may not necessarily be applicable to the e-Commerce environment.

The new role of the end user raises the question of whether the scales developed for measuring user satisfaction to date are valid. Molla and Licker (2001) argue that while both the popular and academic literature promise many benefits to be derived from e-Commerce systems, these claims are not widely supported by empirical data. They also point out that although *use* and *user satisfaction* are the most widely utilised dependent variables in the e-Commerce literature, standard and systematic criteria for assessing these variables have not been developed. The conceptual paper of Molla and Licker proposes an adaptation of the IS Success Model by defining an independent variable named "*Customer E-commerce Satisfaction*" (Molla & Licker, 2001:6). According to these authors the use of this variable provides an appropriate surrogate for assessing e-Commerce success.

2.12.3 Service Quality: An approach to evaluating the IS function in e-Commerce business

Another distinct feature of the e-Commerce environment is that the business primarily offers its products or services by using ECIS, viz., the website and the associated applications that run on both the client and server side. This implies that an assessment of the customer's interaction of the business through its website, is inherently also an assessment of products delivered by the IS function of the e-Commerce business.[11] Zhu & Kraemer (2002) assert that since customers are the end-users of IS-based services, it is their perception of service quality that matters most.

However, even though there are a number of studies that investigated service quality in the e-Commerce environment (e.g., Zeithaml *et al.*,

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[11] In the IS literature, service quality concepts have been used to assess the IS function as a service provider (e.g. Pitt *et al.* 1995; Pitt *et al.*, 1997; Jiang *et al.*, 2002).

2002; Cox & Dale, 2001; Zeithaml, 2002; Parasuraman *et al.*, 2005), these have focused mainly on evaluation constructs associated with marketing. This points to a gap in the literature regarding how service quality concepts can be extended to the evaluation of the IS function within an e-Commerce context.

Table 2.7 summarises some of the e-Commerce studies that are relevant to IS Success evaluation, from a user-satisfaction perspective. The summary of findings in this table shows that some e-Service Quality studies, which were found mainly in the Marketing literature, are pertinent to the evaluation of both the user-satisfaction and systems quality (website) dimensions of IS Success. In particular, these studies reinforce the relationships between service quality and systems quality with that of user satisfaction. This is indicative that there is a convergence of multi-disciplinary themes in the evaluation of ECIS Success.

Table 2.7: A sample of studies demonstrating the convergence of user satisfaction, service quality and systems quality dimensions of IS Success

Source	Main Findings	Relevance to IS Success Model
Boyd (2002)	Proposes a comprehensive framework and associated metrics for assessing total customer satisfaction with e-Commerce websites.	User satisfaction
Zeithaml (2002)	The study presents a conceptual model for understanding service quality. The model demonstrates the relationship between website design and customer perceptions of service quality.	Combined User satisfaction, Service Quality
Wang (2001)	Identifies e-Service Quality and e-Satisfaction as critical components to e-Commerce assessment.	Combined User satisfaction and Service Quality.

Contd/...

Source	Main Findings	Relevance to IS Success Model
Parasuraman *et al.* (2005)	Develops a service quality model for online stores, viz., E-S-QUAL, together with metrics for measuring service quality. Two scales are developed. E-S-Qual (22 items) contains four dimensions: Efficiency, System Availability, Fulfilment, and Privacy. E-RecS-Qual (11 items) contains three dimensions: Responsiveness, Compensation, and Contact.	Combined User satisfaction and Service Quality.
Doolin *et al.* (2005)	A research model is developed demonstrating the importance of customer's perceived risk and Internet shopping experience with online purchasing behaviour.	User satisfaction
Lee & Lin (2005)	A research model is developed to examine the relationship between e-service quality and customer satisfaction. Customer satisfaction is dependent on: Website design, Reliability, Responsiveness, Trust, Personalization	Combined User satisfaction, Service Quality, and Systems Quality

2.13 The systems quality dimension of IS Success

The systems quality dimension of success is concerned with performance characteristics of the IS being studied (Grover *et al.*, 2005). Sabherwal *et al.* (2004) define this dimension as the quality of the system and the information it provides, in terms of the system's reliability, ease of use, response time, as well as the relevance, timeliness and accuracy of the information. Another definition of systems quality refers to the performance of the system in delivering information (DeLone & McLean, 1992). In general, the systems quality dimension of IS Success tends to focus on the technical nature of the system as opposed to the impact the system has on its users (user satisfaction) or the business (net benefits). From the IS Success Model perspective, systems quality is considered as one of the antecedents of IS Success.

2.13.1 Dimensions of Systems Quality

The IS Success literature consists of a number of studies that have focused on Systems Quality. Table 2.8 provides an overview of systems quality dimensions that have been identified in the literature by Nelson *et al.* (2005).

Table 2.8: Systems quality dimensions
Source: Nelson *et al.* (2005:206)

Dimension	Definition
Accessibility	The degree to which a system and the information it contains can be accessed with relatively low effort.
Reliability	The degree to which a system is dependable (e.g. technically available) over time.
Response Time	The degree to which a system offers quick (or timely) responses to requests for information or action.
Flexibility	The degree to which a system can adapt to a variety of user needs and to changing conditions.
Integration	The degree to which a system facilitates the combination of information from various sources to support business decisions.

In another study Stylianou and Kumar (2000) identified six dimensions of systems quality, viz., infrastructure quality, software quality, data quality, information quality, service quality, and administrative quality. Table 2.9 shows how these dimensions are operationalised according to specific systems processes.

Table 2.9/...

Table 2.9: System quality attributes and metrics for IS processes
(Source: Stylianou & Kumar, 2000:103)

Process	Attributes	Metrics	Quality Dimensions
Systems Development	Cost	$ per hour, $ of person hours	Administrative Quality
	Time	Days	Administrative Quality
	Bugs	# of system crashes, # of minor faults	Data Software, Infrastructure quality
	Ease of use	# of requests for help, learning time	Information Quality
System Maintenance	Ease of fixing problems	Response time for maintenance requests	Service Quality

Over the years studies have focused on a variety of different evaluation constructs for IS Quality. Hamilton and Chervany (1981) advanced an evaluation scheme that comprised the following components: data currency, response time, turnaround time, data accuracy, reliability, completeness, system flexibility, and ease of use. In comparison, Srnivasan (1985) identified response time, system reliability, and system accessibility as appropriate measures for this dimension of success. In another study, Seddon (1997) considered system quality to be concerned with bugs in the system (system reliability), user interface consistency, ease of use, documentation quality, and quality and maintainability of the program code.

More recently, Whitworth *et al.* (2005:94-95) identified eight dimensions of Systems Quality. These are: *extendibility* (the system's ability to make use of outside elements); *security* (the ability of a system to protect itself against unauthorised entry); *flexibility* (a system's ability to work in new environments); *reliability* (the ability of a system to keep operating despite internal changes like stress and load); *functionality* (the system's ability to act directly on its environment to produce a desired change); *usability* (a system's ability to minimise the relative resource costs of action); *connectivity* (a system's ability to communicate with other systems); and *privacy* (a system's ability to control the release of information about itself).

2.13.2 Systems quality in the e-Commerce environment

Systems quality research in the e-Commerce literature has focused mainly on the web-interface. DeLone and McLean's definition of system quality supports this assertion:

> *"System quality in the Internet environment, measures the desired characteristics of an e-commerce system. Usability, availability, reliability, adaptability, and response time (e.g. download time) are examples of qualities that are valued by users of an e-commerce system"*
>
> DeLone and McLean (2004:34).

Delone and McLean (2004) have attempted to demonstrate that the IS Success Model can be applied in the e-Commerce environment. By using two case studies, these authors suggest that dimensions of systems quality that could be applied in the e-Commerce environment are *usability* (website should be easy to use), *availability* (of the website), and *download time*. A number of other e-Commerce studies also focused on the system quality dimension of web sites. For example, McKinney *et al.* (2002) identified a number of constructs for measuring e-Commerce Success. These were *access* (responsiveness, quick loads), *usability* (or ease of use of the website), and *navigation* (easy to go back and forth, number of clicks). Lee and Kozar (2006:6), also focused on the website, by using the following constructs for evaluation:

- *navigability*: the website's capability to provide alternative interaction and navigating techniques;
- *response time*: the time taken to respond to page and information requests;
- *personalisation*: provision of an individualised interface, effective one-to-one information and customised service;
- *telepresence*: the sense of reality created in the virtual environment; and
- *security*: encryption, third-party affiliations, etc.

Palmer (2002:157) also investigated website quality, and identified the following success constructs: *download delay* (initial access speed, speed of display between pages), *navigation* (arrangement, sequence, links, layout), and *interactivity* (customisation). Liu and Arnett (2000) measured system quality by using six variables, viz., processing speed, quick error recovery, correct operation and computation, security, balanced payment method between security and ease of use, and coordination to support all functional areas. Other systems quality measures identified in the e-Commerce literature include systems responsiveness and response-time (Molla & Licker, 2001; Tiwana, 1998), privacy and security (Molla & Licker, 2001), search facilities, responsiveness, and multimedia capability (Cao *et al.*, 2005).

In all of the studies discussed above, systems quality investigations have focused mainly on aspects of website design. There are no studies that deal with the quality attributes of back-end systems such as the database, order processing systems, and logistics management systems. This points to a serious gap in the literature, given that the focus on the web-interface only has tended to dilute our understanding of overall IS quality in the e-Commerce environment. Further research is required to investigate systems quality within a broader context so as to include other systems that comprise ECIS.

2.14 Theories underpinning IS Success studies

In reviewing the IS Success literature, no dominant theoretical perspective was found. Nor is there an abundance of citations of the so-called grand theories. In cases where theories have been used to underpin research models and hypotheses, these were adapted from other disciplines. Examples were Communications Theory (Shannon & Weaver, 1949), Resource-Based Theory (Penrose, 1959), and Theory of Reasoned Action (Fishbein & Ajzen, 1975).

DeLone and McLean (1992) used the theory of communication (Shannon & Weaver, 1949) as the theoretical underpinning of the IS Success Model, by taking the view that an IS is also a communication system. The IS Success Model was thence conceptualised using Shannon and Weaver's three levels of a communication system, viz., the technical, semantic and effectiveness levels. Besides the DeLone and Mclean study, the theory of communication was not used in other research, except by indirect citation of the Delone and McLean (1992) paper. The IS Success Model itself has been used as a theoretical underpinning in several studies since 1992.

The Technology Acceptance Model (TAM) is a widely referenced theoretical model in the IS literature for predicting intention to use and acceptance of IS by individuals (Devaraj *et al.*, 2002). The TAM model, developed by Davis (1986, 1989), is derived from the Theory of Reasoned Action (Fishbein & Ajzen, 1975). In terms of this model, perceived ease of use, and perceived usefulness determine the attitude toward an IS. The attitude, in turn, leads to one's intention to use an IS and the eventual acceptance of the system (Davis *et al.*, 1989). The TAM model has been used in a number of studies that investigated the use of web-based IS (e.g., Gefen & Straub, 2000; Lederer *et al.*, 2000) and web-based IS Success (e.g., Garrity *et al.*, 2005).

The resource-based theory posits that firms create performance advantages by assembling resources that work together to create organizational capabilities (Penrose, 1959). The theory assumes that a firm's performance is founded on its capabilities, i.e., its resources and its competitors' difficulty in imitating them (Zhuang & Lederer, 2006). In the IS literature, the resource-based view has been used to explain how firms can create competitive value from IS assets, and how sustainability resides more in the organisation's skills to use IS than in the technology itself. IS payoffs depend heavily on fitting the pieces together, i.e., on

exploiting relationships among complementary resources (Zhu & Kraemer, 2002). Resource-based theories have been referred to in several studies, e.g., Clemons and Row (1991), and Bharadwaj (2000). Zhu and Kramer (2002) aver that the resource-based view provides a solid theoretical foundation for studying the contexts and conditions under which e-Commerce may produce performance gains.

In summary, because of fragmentation in the IS Success body of knowledge, there are no consistent trends in the application of theories. Instead, a number of different theories are applied. For example, Sabherwal *et al.* (2004) use a combination of six theoretical areas to develop their research model.[12] Furthermore, there are no dominant grand theories. The three theories summarised in the foregoing paragraphs are presented solely for the purpose of providing some examples of the types of theoretical underpinnings of IS Success studies found in the literature. In the next section, an overview of a selection of studies is presented. From this, a better understanding can be obtained of the application of theory in the IS Success literature.

2.15 Pre- and post- e-Commerce IS Success studies: a comparative analysis

The body of literature pertaining to IS Success is an expansive one. The main purpose of this section is to present an overview of the research that is pertinent to this domain. A sample of fourteen studies that deal with IS Success in e-Commerce environments, and ten pre- e-Commerce studies was chosen for the comparative analysis. These studies are summarised and contrasted with one another in respect of theoretical underpinnings, findings, and stakeholder evaluative perspectives.

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[12] The theories used by these authors were: expectancy theory, theory of reasoned action, theory of planned behaviour, technology acceptance model, social cognitive theory, and innovative diffusion theory.

The columns in Tables 2.10 and 2.11 are organised as follows:

- Source: These are listed in chronological order.
- Main findings: These are summarised.
- Stakeholder / IS Success dimension: Using the IS Success Model as a basis (DeLone & McLean, 1992, 2003), the third column identifies the IS Success dimensions that each of the studies deals with. Additionally, based on Seddon and co-authors' respecification of the IS Success Model (Seddon *et al.*, 1999), the relevant stakeholder involved in undertaking the evaluation is identified.
- The last column indicates what major theory, if any, was used to underpin the study.

Table 2.10/...

Table 2.10: A sample of IS Success studies (pre-e-Commerce)

IS Success Studies: Pre-Commerce			
Source	**Main findings**	**▪ Stakeholder ▪ IS Success Dimension**	**Theoretical Foundation**
Davis (1989)	Developed the Technology Acceptance Model (TAM). Postulates that Technology Usage is determined by *Behavioural Intention* to use the technology, which in itself is determined by *Perceived Usefulness* and *Attitude*. *Perceived Ease of Use* and *Perceived Usefulness* are primary determinants of *Systems Use*.	▪ End user ▪ Systems Use	Theory of Reasoned Action.
Drury & Farhoomand (1998)	Develops a hierarchical structural model of IS Success. Five dimensions of success are identified and tested: System Characteristics, Output Quality, Systems Outcomes, User Requirements, and Inter-corporate Outcomes.	▪ Organisational view of Success ▪ Multi-dimensional IS Success categories	No major theory discussed. Model is derived from analysis of prior studies.
Seddon *et al.* (1999)	A two dimensional matrix, with 30 possible units of analysis for IS evaluation is proposed. The model is based on two major dimensions of IS Success, viz., The IS stakeholder interest in evaluation and a System Dimension.	▪ Multi-stakeholders ▪ Multi-dimensional	No major theory discussed. Model is derived from analysis of prior studies.
DeLone & McLean (1992)	Based on Communication Theory, and an analysis of empirical studies, an IS Success Model is derived based on 6 dimensions: Information Quality, Systems Quality, Information Use, User satisfaction, Individual Impact, and Organisational Impact.	▪ Multi-stakeholders ▪ Multi-dimensional IS Success categories	Communication Theory
Whyte & Bytheway (1996)	Based on service management constructs, a set of 21 attributes to measure IS Success is developed. Argues that these attributes can be incorporated into a routine method for assessing the level of service provided by an IS department.	▪ End user ▪ Service Quality.	No major theory discussed. Research model is derived from previous studies

Table continued /...

IS Success Studies: Pre-Commerce			
Source	**Main findings**	**▪ Stakeholder ▪ IS Success Dimension**	**Theoretical Foundation**
Rai *et al.* (2002)	Empirical assessment of IS Success Models of DeLone and McLean (1992) and Seddon (1997). Findings support variables of System Quality, Information Quality, Perceived Usefulness, User Satisfaction, IS Use.	▪ End-user ▪ Multi-dimensional IS Success categories	Theory of planned behaviour and TAM.
Roldan & Leal (2003)	The authors apply the D&M IS Success Model to the EIS environment. Findings show that system quality and information quality affect use of EIS as well as user satisfaction. Furthermore use and user satisfaction have an impact on the individual user in terms of: speed of problem identification, speed of decision-making, and extent of analysis. The impact on individual users has a similar effect on the organisation in terms of: shared organisational vision, organisational decision-making effectiveness; perceived organisational performance.	▪ End-user perspective. ▪ System Quality, Information Quality and User satisfaction.	No major theory discussed. Investigation based on IS Success Model.
Sabherwal *et al.* (2004)	Based on a study of 115 papers published between 1980 and 2003, provides a comprehensive understanding of IS Success dimensions and determinants. The model explains interrelationships among four success factors (user satisfaction, system use, perceived usefulness, system quality), and their relationships with three user-related factors (user experience, user attitudes, user participation) and three contextual factors (top management support, quality of IS development team, facilitating conditions.	▪ Multi-stakeholders ▪ Multi-dimensional IS Success categories	Combined theoretical approach: Expectancy theory, theory of reasoned action; theory of planned behaviour; social cognitive theory; innovative diffusion theory

Table continued /...

IS Success Studies: Pre-Commerce			
Source	**Main findings**	▪ **Stakeholder** ▪ **IS Success Dimension**	**Theoretical Foundation**
De Guinea *et al.* (2005)	In a study of 115 small businesses in Canada, the authors test the relationships between 3 constructs (managerial support, consultant effectiveness, vendor support) with user satisfaction, organisational impact, overall IS effectiveness and intention to expand. The study finds that both managerial support and vendor support are essential for effective IS in Canadian small business.	▪ Multi-stakeholders ▪ User satisfaction ▪ Organisational impact	No major theory discussed. Investigation based on IS Success Model.
Nelson *et al.* (2005)	Presents a model consisting of nine determinants of information quality and system quality: *Information Quality*: Completeness, Accuracy, Format, and Currency. *System Quality*: Reliability, Flexibility, Accessibility, Response Time, and Integration. The research further finds a relationship between Information and Systems Quality with Information and System Satisfaction.	▪ End-user ▪ Information Quality ▪ System Quality.	No major theory discussed. Research model is derived from previous studies.

Table 2.11 /...

Table 2.11: A sample of IS success studies from the e-Commerce literature

IS Success Studies: e-Commerce Focus			
Source	**Main findings**	**▪ Stakeholder ▪ IS Success Dimension**	**Theoretical foundation**
Barnes & Vidgen (2001)	Using service quality constructs, proposes a 24-item scale to measure website quality. Website-related constructs are developed for the 5 dimensions of the SERVQUAL model (Tangibles, Reliability, Responsiveness, Assurance, Empathy).	▪ End user (customer perspectives) ▪ Systems Quality (website)	No major theory discussed. Model is derived from prior studies on service quality.
Molla & Licker (2001)	A theoretical study that derives a re-specified IS Success Model. The resultant e-Commerce Success model uses "Customer e-Commerce Satisfaction" as the dependent variable, which in turn is affected by the constructs of: System Quality, Content Quality (on Website), Use, Trust, Support and Service.	▪ End user perspective. ▪ User satisfaction	No major theory discussed. Model is derived from analysis of prior studies.
Chen & Hitt (2002)	The study of the online brokerage industry examines how website quality viz., ease of use, personalisation, website usage affects customer retention.	▪ End user ▪ Systems Quality (website)	No major theory discussed.
McKinney *et al.* (2002)	The paper develops constructs for measuring Web customer satisfaction. Nine key constructs, separated into Information Quality and Systems Quality constructs were identified: Information Quality: Relevance; Timeliness, Reliability, Scope, Perceived Usefulness. Systems Quality: Access, Usability, Navigation, Interactivity.	▪ End user ▪ User satisfaction ▪ Information Quality ▪ Systems Quality (website)	Expectancy-Disconfirmation theory

Table continued /...

IS Success Studies: e-Commerce Focus			
Source	**Main findings**	▪ **Stakeholder** ▪ **IS Success Dimension**	**Theoretical foundation**
Kim *et al.* (2002)	Six dimensions of architectural metrics relating to the website are proposed: internal stability, external security, information gathering, order processing, system interface, and communication interface.	▪ End User ▪ Systems Quality (website)	Based on theory in the Architecture literature
Devaraj *et al.* (2002)	Identified antecedents of B2C channel satisfaction and preference (perceived usefulness, ease of use, time, price savings, reliability).	▪ End user (Customer-focused) ▪ User satisfaction	TAM, Transaction Cost Analysis.
Torkzadeh & Dhillon (2002)	Proposed means and fundamental objectives that influence e-business success. Means: product choice, online payment, shopping travel, shipping errors; fundamental objectives: shopping convenience, Internet ecology, customer relations, product Value.	▪ End-user & e-Commerce Management ▪ User satisfaction	No major theory discussed. Model is derived from analysis of prior studies.
Zhu & Kraemer (2002)	In a study of net-enhanced organisations in the manufacturing sector, four e-business capability metrics were derived: information, transaction, customisation, and supplier connection. Significant relationships between these metrics were found with that of firm performance.	▪ Organisational view of IS Success. ▪ Multi-dimensional IS Success categories	Resourced-based theory.
Boyd (2002)	Proposes a goals, questions, indicators, measures (GQIM) approach to measure customer satisfaction with e-Commerce websites. This approach, which has ten steps, starts with high-level business goals, and breaks them into measurable sub-goals. IT continues to identify measures and indicators that address those goals.	▪ End user, & IS Manager ▪ Multi-dimensional categories of IS Success including, user satisfaction, systems quality, net benefits.	No major theory discussed. Model is derived from analysis of prior studies.

Table continued /...

IS Success Studies: e-Commerce Focus			
Source	**Main findings**	▪ **Stakeholder** ▪ **IS Success Dimension**	**Theoretical foundation**
Delone & McLean (2004)	A theoretical study that demonstrates that the six dimensions of IS Success in the IS Success Model (Information Quality, System Quality, Service Quality, Use, User satisfaction, and Net Benefits) are applicable in the e-Commerce environment.	▪ End user (customer perspectives). ▪ Multi-dimensional IS Success categories	No major theory discussed. IS Success Model used as basis for findings.
Lee & Kozar (2006)	Website quality (system quality, navigability, security, business reputation, & price savings); correlated website quality positively with firm performance; perceptual gaps exist between customers and managers/designers	▪ End user & e-Commerce managers ▪ Systems Quality ▪ Organisational benefits	No major theory discussed. Model is derived from analysis of prior studies.
Cao *et al.* (2005)	Presents a framework of Website Quality indices for evaluating website quality. This includes System Quality, Information Quality, Service Quality, and Attractiveness, which jointly affect Perceived Usefulness of the website and Perceived Ease of Use. The latter jointly affect customer's intention to revisit a Website.	▪ End user (customer) ▪ Systems Quality, Information Quality, Service Quality, User satisfaction.	Technology Acceptance Model & IS Success Model
Garrity *et. al.* (2005)	Examines Web-based Information Systems (WIS) Success, with the focus on User satisfaction. Three success components identified: Task Support Satisfaction, Decision Support Satisfaction, and Interface Satisfaction.	▪ End user (customer) ▪ Systems Quality (website)	Technology Acceptance Model & IS Success Model
Whitworth *et al.* (2005)	Proposes an expansion of the TAM model. Web of System Performance (WOSP) model is proposed. Uses general systems principles to derive systems performance goals of: Security, Extendibility, Flexibility, Reliability, Functionality, Usability, Connectivity, and Privacy.	▪ IS Management ▪ Systems Quality.	Technology Acceptance Model

Close perusal of the studies presented in the tables above, serves to reinforce the notion that the field of IS Success is fragmented both in the pre- and post- e-Commerce eras. Furthermore, the studies in these tables demonstrate that there are a number of different models of success, and a variety of approaches to evaluation.

Table 2.12 below presents an analysis of the studies presented above. The table contrasts the e-Commerce studies with those from the pre- e-Commerce era, according to the IS Success dimension, the evaluation perspective, and the use of theory in the studies.

Table 2.12: Comparative analysis of pre- & post- era e-Commerce studies

	Pre-e-Commerce	e-Commerce era
IS Success Dimension:		
Use	1	0
User satisfaction	3	5
Information Quality	2	2
Organisational Impact	2	1
Service Quality	1	0
Multi-Dimensional	5	2
System quality	3	6
Evaluation Perspective		
End user	5	8
Management & end user	6	1
Management	2	1
Use of Theory		
Study based on a substantive theory	4	3
No substantive theory	6	11

With regard to the IS Success dimension, no one dimension has overwhelmingly dominated the pre- e-Commerce studies. The success dimensions of user satisfaction and systems quality dominate the e-Commerce studies. Both these dimensions, however, relate to the website only, i.e., customer satisfaction with the use of the website and the quality of the website. None of the studies have investigated the

back-end ECIS, which form an integral part of e-Commerce infrastructure.

Whereas the pre- e-Commerce studies in the sample have examined IS Success from the perspective of both management and the end user, the e-Commerce studies were dominated by an end-user focus only. Of the eight studies that had an end-user focus, all of them investigated customers' perceptions of website success. Only two studies in the sample considered e-Commerce managers' perspectives of IS Success.

Lastly, the majority of both the e-Commerce and pre- e-Commerce IS Success studies in the sample were not based on any substantive theoretical framework. This is indicative of the absence of strong theoretical frameworks to guide IS Success research.

2.16 Conclusion

The body of literature pertaining to IS Success is an expansive one. The nature of the research questions in this study necessitated a wide coverage of the literature. The broad ambit of the principal research questions influenced the literature review to be as wide as possible. The user-satisfaction and service quality dimensions of success were treated in greater depth than other success dimensions, as a preliminary literature review indicated that these were the most common approaches to IS evaluation. The fact that other dimensions of IS Success were not treated in as much detail as these is not to suggest that they were of less importance in this study. Rather, it demonstrates that these success dimensions are not widely covered in the literature. This imbalance does, in fact, serve to reinforce the research aims, i.e., that this study should approach the field with a more open mind, so as to empirically ground success factors, rather than rely on a fragmented body of literature to provide a theoretical underpinning.

There are several important conclusions that can be made from the study of the literature:

- **Voluminous ECIS Success metrics:** I agree with DeLone & McLean (1992: 88), who posit that there is not one success measure but many, and that there are as many metrics as there are studies. This is true with regard to both IS Success studies in general as well as the e-Commerce literature. With such a diversity of options, researchers are confronted with great difficulty in choosing appropriate success metrics to apply in the field. Consequently, the research problem identified in Chapter One cannot be sufficiently addressed on the basis of the existing body of knowledge.

- **Paucity of ECIS Success studies in the broader e-Commerce literature:** An assessment of the e-Commerce literature in general indicates a paucity of studies into ECIS Success. This is substantiated by Wareham *et al.* (2005), who profiled e-Commerce research in the period 1997 to 2003. In an in-depth analysis of 582 articles from both practitioner and professional journals, they found that 5% of research articles dealt with the *"value of IS"*, which they describe as "*analytical exercises that attempt to determine the economic value realized in electronic commerce applications*" (Wareham *et al.*, 2005:3). They also describe this domain of research as being *"primarily concerned with the measurement of the financial return on investments in e-Commerce applications..."* (Wareham *et al.*, 2005:9). This is indicative that the research in this field has focused mainly on financial indicators of IS value. This is just one approach to evaluating ECIS Success. Without a coherent framework to understand IS Success more broadly, financial evaluation exercises may not yield proper results. The study by Wareham *et al.*, in particular, supports my own assessment of the literature, i.e., that the issues identified in the research problem regarding ECIS Success, have not been sufficiently addressed in the extant body of knowledge.

- **e-Commerce rests on a platform of IS Success.** E-Commerce businesses rely on successful ECIS, to remain operational twenty-four hours a day, seven days a week. IS Success concerns are greatly elevated in the e-Commerce business environment as compared with brick and mortar businesses. Indications of failure cannot be attributed to poorly designed websites only. However, what is not clear in the literature is exactly how other elements of ECIS have contributed to failure. The literature does not sufficiently address issues related to the success of back-end IS, and how these systems should be managed.

- **Narrow end-user (customer) and web-interface focus:** Only a few of the studies that were reviewed provide business managers with a sufficient breadth of understanding to enable them to grasp all of the issues relevant to the dynamics of IS Success. The application of almost all studies identified in the literature, only arms managers with knowledge of customers' expectations. Additionally, most of the studies consulted were focused mainly on website design and strategies to evaluate the success of the website. This narrow focus does not address the research problem in this study. Managers need to better understand how to successfully manage ECIS from within the organisation so as to meet customers' expectations. The current body of literature has produced an abundance of knowledge regarding customer satisfaction and website quality, with scant regard to the internal management of ECIS. This demonstrates that the research questions identified in this study are relevant and warrant an empirical enquiry.

- **Not many theories:** In Section 2.14, I presented an overview of some of the theories used by researchers to underpin their studies. In Section 2.15, I demonstrated that there were few theories cited in the literature. It is my view that as a consequence of the fragmentation of

the IS evaluation field of research, there are no consistent trends in the application of theories. In addition, an assortment of theories is used. This leads me to conclude that the development of an IS Success theory, which is one of the main aims of this study, is a worthy one that will be of value to the academic community.

Finally, from the foregoing conclusions, and the work undertaken in this chapter, it is clear that the research questions raised in Chapter One remain a challenge and that the aims of this study are of importance to the IS academic community. This conclusion provides an appropriate foundation on which to develop an appropriate research design for this study. This is outlined in the next chapter.

CHAPTER THREE

PHILOSOPHICAL FOUNDATION AND RESEARCH DESIGN

The philosophers have only interpreted the world, in various ways; the point is to change it

(Karl Marx, 1845)

Overview

This chapter explains the journey that I have undertaken, which started with a rudimentary understanding of research methods and developed into a much broader and deeper perspective that was required for doctoral research. Thereafter a framework is presented to show the relationships between the salient elements of the research design, viz., research philosophy, research approaches and techniques, and the everyday world in which the research problem was identified, articulated and operationalised. In the light of the ongoing debate concerning IS as a discipline, the chapter then considers the nature of IS academic research. This is followed by a discussion that compares and contrasts various philosophical underpinnings of Social Science research that were identified in the IS literature. A motivation is then presented as to why the critical realist paradigm is an appropriate intellectual underpinning for this study. The two main methodological paradigms of quantitative and qualitative research are subsequently contrasted. Thereafter, I present a framework for the development of theory. This is followed by a discussion of how the canons of positivist research should be adapted for qualitative research evaluation. Finally, a summary of the salient aspects of the research design is presented.

Introduction/...

3.1 Introduction

Epistemology[1] derives from *episteme,* the Greek word for "knowledge". Henning (2004) avers that epistemology is the philosophy of knowledge or "*how we come to know*". A scientific inquiry involves the pursuit of knowledge in which we seek as close an approximation of the truth as possible (Babbie & Mouton, 2001). The epistemological positions of researchers are influenced by their ontological stance which, literally translated from its Greek derivative, means *"the study of being".* Epistemology and research methodology are intimately related. The former involves the *philosophy* of how we come to know the world, and the latter involves the *practice* of coming to know and how we study this practice (Henning, 2004:15). The discussion of philosophy that follows in Section 3.4 is important, as it is an essential component of a research degree especially at doctoral level (Harré, 1985).

In this chapter, I reflect on the epistemological influences on this research, and the methodological paradigms associated with these. I also describe the research design,[2] and justify the rationale behind the approaches that have been pursued in this research. The discussion of the research design in this chapter also represents an important component of the learning curve that took place during the initial investigation. When I initially undertook this doctoral study, the scope of my scientific thinking was narrow in that it was limited to the research exposure during my Master's degree. After initial readings on scientific

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[1] Epistemology, or theory of knowledge, is the branch of philosophy that studies the nature and scope of knowledge. The term "epistemology" is based on the Greek words *episteme* (knowledge) and *logos* (account/explanation); it is thought to have been coined by the Scottish philosopher James Frederick Ferrier.

[2] Following on Babbie & Mouton (2001:74-75), I distinguish between the "*research design*" and the "*research methodology*". The research design focuses on the outputs of the study, i.e., what type of study was envisaged during the planning of this research, and the kind of results that were expected. The point of departure is the research problem at hand and the focus is on the logic of the research, i.e., the nature of evidence that is required to address the research question. The research methods are discussed in Chapter Four.

practice as well as after a number of discourses with experienced researchers, I came to the conclusion that it was important for me to firstly gain an understanding of the various schools of scientific thought. This would be an important foundation upon which I would be able to make informed decisions regarding a research design that would be suitable to achieve the research aims and objectives that were outlined in Chapter One.

3.2 The research design in context: the Three World Framework

The purpose of academic research is to add something of value to the body of established knowledge. According to Mouton (1996) there are "*three worlds*" of knowledge, viz., the world of everyday life, i.e., lay peoples' knowledge, the world of science and scientific knowledge, and the world of meta-science.[3] The pursuit of scientific research is fundamentally an interaction between these three worlds.

Figure 3.1 presents the basic tenets of these three worlds, and following on Mouton (1996:7-10; 2001:138-139) we can distinguish among them as follows:[4]

- In *World One*, we require knowledge to enable us to live our day-to-day lives. This world consists of objects or entities such as individual human beings, collectives, and organisations that use knowledge such as common sense, practical skills, experience, etc., to solve technical problems, make decisions, and thus cope more effectively with everyday life. It is the pragmatic interest in day-to-day living that drives individuals to acquire knowledge in World One.

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[3] Mouton (1996:11) describes the world of metascience as consisting of "*the meta-reflective disciplines (philosophy and sociology of science) that make the world of science into an object of critical inquiry and reflection*".

[4] Note that the distinction between these three worlds is for analytical purposes only, and as such, does not imply that these worlds exist separately in everyday life.

- In *World Two*, researchers view the phenomena of World One as objects of systematic and rigorous inquiry. This world consists of various scientific disciplines (e.g., social science, humanities, natural science), a body of scientific knowledge (theories, models, explanations, paradigms), and a number of methods with which to practise science. The search for the truth, or the epistemic interest, is the overriding goal in World Two. Just as the pragmatic interest promotes the acquisition of knowledge in World One, the epistemic interest permeates the whole process of knowledge production in World Two.
- In *World Three*, researchers have to constantly submit their research decisions to critical reflection, e.g., making choices as to which theories to select, how to measure phenomena, which research design to choose, etc. Over the years, this practice has led to the development of various meta-disciplines such as the philosophy and methodology of science, research ethics, and the sociology of science.

Figure 3.1/...

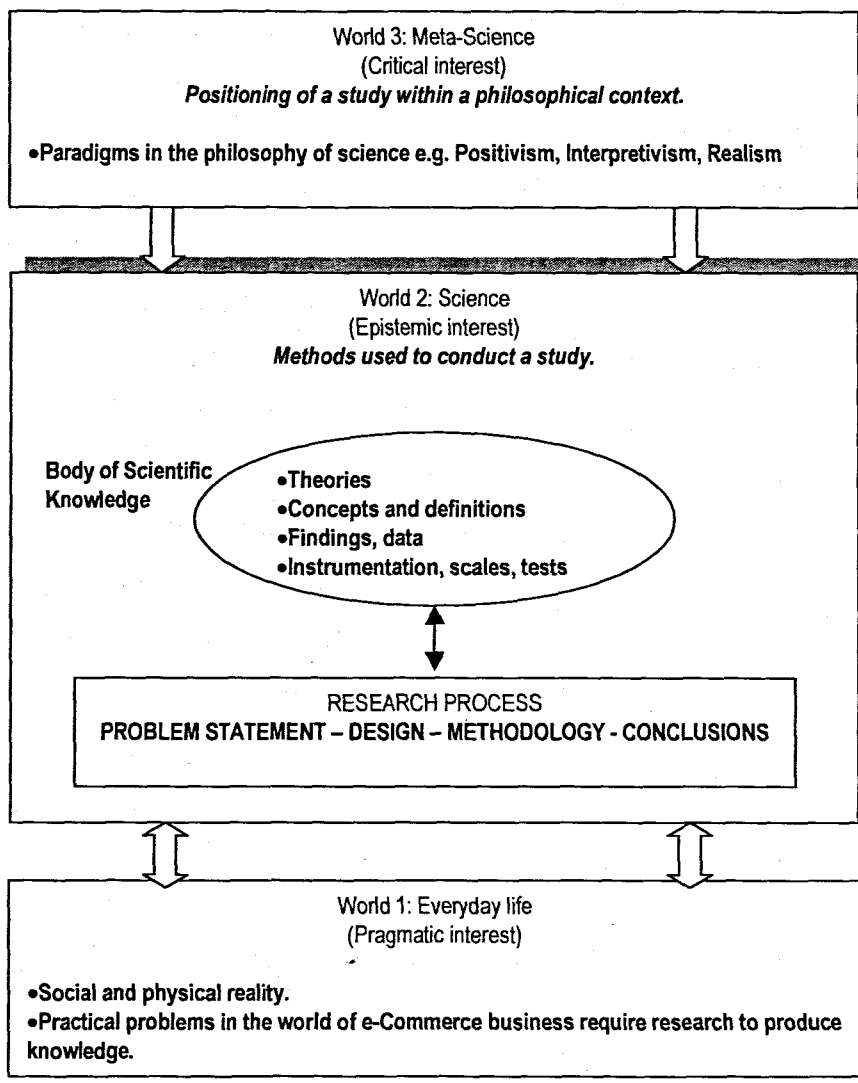

Figure 3.1: The Three-World Framework
(Adapted from: Mouton, 1996:10; Mouton, 2001:139-141)

In the context of this study, the analogy of the three worlds can be explained thus: the worlds of business and e-Commerce, which are part of our everyday lives, is a subset of *World One*. The research problem relates to a need in *World One*. The solution of this problem, requires the researcher to interact with *World Two*, the world of science, in order to review existing theories, concepts and explanations about the phenomena associated with the research problem, viz., ECIS success. This was done in Chapter Two, in which I concluded that there were not sufficient theories and explanations to solve the problem. Thus the next

step was to engage with the tools and techniques of *World Two* and to make an informed choice regarding their use. However, in making these choices, and in deciding how to apply these research tools, I had to firstly reflect on the various scientific options in *World Two*. This implied that I had to take cognisance of the various paradigms in the philosophies of science and how these philosophies would influence my engagement with *World Two*, i.e., I had to become conversant with the world of meta-science, *World Three*. Accordingly, in the next four sections (3.3 to 3.6) I will

(i) review the well-known paradigms of scientific philosophy appropriate to IS research;

(ii) locate this research undertaking within an appropriate philosophical context; and

(iii) discuss whether either qualitative or quantitative oriented research methods would best serve the objectives of this study.

3.3 Background to philosophical orientation in the IS discipline

A considerable amount of IS research is conducted using the positivistic research tradition (Orlikowski & Baroudi, 1991; Alavi & Carlson, 1992; Roode, 2003). There are perhaps two reasons for this. The first is that IS grew out of the more technical subject of computer science (Baskerville & Myers, 2002) with many IS academics using concepts like systems theory as a basis for the analysis and understanding of business systems (Falconer & Mackay, 2000). Secondly, academics have come to IS from technical backgrounds including engineering, physical sciences and mathematics. But IS has been changing radically and it now encompasses a much broader series of issues, addresses a much wider range of questions, and uses a much more eclectic range of methodological stances and tools (Benbasat & Zmud, 2003). This has happened as technology has become increasingly powerful and stable

and organisations have found applications of IS in every conceivable business, organisational and management domain. This has resulted in IS conceptualisation and research being quite opportunistic in terms of what it uses as reference disciplines. If there is any guideline as to what reference disciplines are relevant to IS, it is that *IS practitioners, consultants or researchers apply useful ideas emanating from other disciplines irrespective of their source of origin*. This catholic approach to ideas has proved quite successful. However, eclecticism has its price and it is not surprising that the IS community of researchers has over the years presented a variety of research methodological arguments as to why varying philosophical stances are appropriate for their research. Papers by Boland (1985), Walsham (1995), Remenyi *et al.* (1997), Dobson (2002), and Klein (2004) are examples of such contributions to the debate on appropriate philosophical underpinnings for IS research. Additionally, there have been much debate and introspection into the nature of the IS discipline in respect of whether or not it constitutes a science in its own right (Khazanchi & Munkvold, 2000; Wyssusek *et al.*, 2002; Benbasat & Zmud, 2003; DeSanctis, 2003). If Einstein's view of science[5] is accepted, then the work conducted by many academics in the IS field constitutes science. But this debate is not likely to dissipate simply on the authority of a physicist, even one of Einstein's standing, and thus it is clear that IS research is certainly a fertile ground for the practice of reflection.

It is now well established that the study of IS is informed on both theory and practice levels by a wide variety of subjects ranging from marketing, consumer behaviour, finance, investment appraisal, project management, corporate strategy, human resource theory (Banville & Landry, 1989; Baskerville & Myers, 2002). Figure 3.2 presents a

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[5] According to Einstein (1950), "*Science is the attempt to make the chaotic diversity of our sense-experience correspond to a logically uniform system of thought. In this system single experiences should be correlated with the theoretical structure in such a way that the resulting co-ordination is unique and convincing.*"

classification of fields of study that have been associated with IS research.

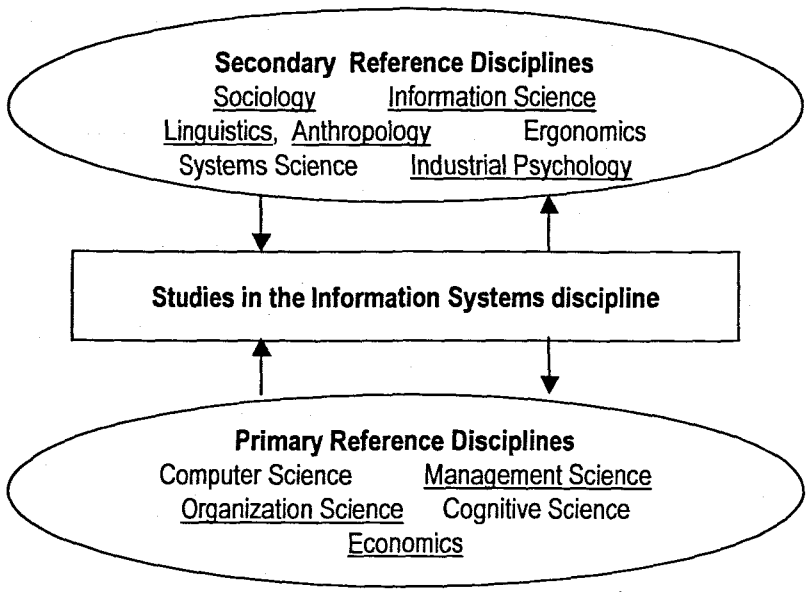

Figure 3.2: A classification of IS reference disciplines with underlined areas indicating Social Science disciplines

(Adapted from: Khazanchi & Munkvold, 2000:35)

Furthermore IS research frequently draws on and combines different aspects of these disciplines (Ridley & Keen, 1998). Thus the term multi-disciplinary (Laudon & Laudon, 2000) or trans-disciplinary,[6] has become common in this field of study. These business and management topics are deeply rooted in social science (see Figure 3.2) and the range of academic research traditions in this field of study is substantial. It is now clear that IS researchers increasingly need to reassess their research options or possible approaches to take advantage of current methodological thinking.

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[6] It is now being suggested that the term trans-disciplinary is more appropriate than multi-disciplinary in the field of business and management studies. Establishing a clear definition of the terms multi-disciplinary or trans-disciplinary, which will highlight the exact differences between these concepts, constitutes a separate study and will not be addressed in this thesis.

The issue of methodological choice has been brought to the IS research agenda by various authors (Falconer & Mackay, 2000; Mingers, 2001; Roode, 2003). Some authors such as Roode (2003) have criticised IS researchers for being too positivistic in their leanings. Others have advanced strong cases for the adoption of alternative non-positivist approaches to IS research, e.g., Interpretivism (Walsham, 1995) and Critical Realism (Dobson, 2002, Mingers, 2002).

3.3.1 The nature of the field of Information Systems research

Before exploring the methodological and philosophical options, it is useful to discuss the context of the field in which IS researchers work. We have not been studying IS for as long as other disciplines such as economics and sociology, since computers were first applied in business around 1952 only. At that stage computers were seen as a technical issue and it was only in the late 1960s that research into their application in organisations began. Thus compared to other academic endeavours, IS as a field of study can be considered as a "*new kid on the block*" (Hirschheim & Klein, 2003:282). As such its academic legitimacy has been challenged by the question: "Should IS be regarded as an academic discipline in its own right?" In answering this question it is necessary to address the definition of the term "discipline".[7] In academic circles it implies boundaries and also suggests enforcement and perhaps punishment. This is rather problematic in an age when the idea of boundaries is on the wane and as a result IS researchers often prefer to talk about their subject as being a field of study rather than a discipline. The notion of a field of study is broader than that of a discipline and it does not require any specific academic consensus to legitimise work done in that field. When viewed in this way, the question does not

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[7] There are different meanings of discipline. It means: (i) control or order exercised over people or animals, esp. children, prisoners, military personnel, church members, etc.; (ii) the system of rules used to maintain this control; (iii) the behaviour of groups subjected to such rules; and (iv) a branch of instruction or learning.

become one of academic legitimacy but rather one of whether the results of the study of IS are actually useful. This approach sees pragmatism (Alvesson & Sköldberg, 2000) as a fundamental requirement for successful research in business and management studies.[8] Of course there is no closure to a debate such as this and the argument continues, involving researchers such as Lucas (1999), Khazanchi and Munkvold (2000), and Hirschheim and Klein (2003). Furthermore, researchers such as Khazanchi and Munkvold (2000) have opened up another dimension to this discussion by focusing on the inter-disciplinary nature of the IS field of study and it has been said that this is one of the sources of the identity crisis in this field. However, at this stage, there is no conclusiveness to this debate. What is clear though, is that there is a sufficient body of rigorous IS research findings, published in academically peer-reviewed journals, to justify a view that IS research is indeed a valuable academic and scientific pursuit.

3.3.2 The study of Information Systems as a Social Science

In response to the question as to whether the IS field is a science, Khazanchi and Munkvold (2000) concluded that IS is indeed a scientific discipline. However, given that the study of IS emanated from disciplines such as Computer Science and Organisational Science (Benbasat & Weber, 1996), it is necessary to resolve the question of what sort of science is being practised in this study. In the contemporary era of IS research, the answer to a question such as "*Does information systems belong to the Natural or Social Sciences?*" may seem obvious.[9] Moreover, IS research papers regularly use the term "*Social Science*". I

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[8] This argument supports the call for more relevant research through Mode Two work as articulated by Gibbons *et al.* (1994), Tranfield and Starkey (1998), Weick (2001) and others.

[9] There are an increasing number of IS research papers, e.g., Walsham (1995), Carlsson (2003), and Mingers (2002) that refer to social theorists. Furthermore, a number of authors have aligned their IS research with well-known social science paradigms such as Critical Theory (Dobson, 2002) and Hermeneutics (Whittaker, 2004).

concur with the various authors that have provided supporting evidence that the IS field of study needs to be regarded as a social science, e.g., Jones (2000), Dobson (2002), and Mingers (2002).

3.4 Traditional philosophical options

From a scientific perspective, philosophy is primarily concerned with the way in which scientists rigorously establish, regulate and improve the methods of knowledge creation in all fields of intellectual endeavour (Chia, 2002). The first step in understanding the implications of the methodological options in any research undertaking is to review the main features of the principal philosophical schools of thought. Having knowledge of these different options has become an integral part of the study of social science research. IS is essentially a pluralistic field (Galliers, 1992) and thus it is especially relevant for a researcher to be familiar with this debate and to be able to understand and reflect on the differences and similarities between these philosophical choices and to consequently take a position on them.

There were different options that were at my disposal, with each of them comprising a particular nuance and its own vocabulary. A crucial aspect of research is that the choices made by the researcher should be reasonable and that they are made explicit in the research report (Denscombe, 2003). Research in the IS field has been classified according to three well-known philosophical approaches, viz., positivism, interpretivism, and critical theory (Orlikowski & Baroudi, 1991).

3.4.1 Positivism or Logical Positivism

Positivist or logical positivist[10] research is based on the notion that research can be objective, that the researcher is independent and that the results are valid, reliable and generalisable. This type of research, which is often directly associated with the scientific method (Galliers, 1992), draws on the notions of reductionism, determinism and falsification.[11] In the physical and life sciences, positivism is regarded as being the research paradigm that has delivered the scientific and engineering successes such the electric motor, the internal combustion engine, manned flight, a heart transplant and a robot on Mars. Positivism has served scientists of the past well, and is still held in high regard by many researchers, whether they be in the physical and life sciences or in the social sciences.

When scholars began to turn their attention to how organisations and the individuals within them functioned, they looked towards the scientific method. This led to a new scientific community that addressed what was then referred to as the social sciences. One of the initiators of this, Auguste Comte (Comte, 1975), is noted for his positivist approach. The main thrusts of Comte's philosophy are summarised by Babbie and Mouton (2001:22) as follows:

> *"For Comte the ultimate idea is to establish a society founded on scientific principles. This ideal could only be realized if the social sciences obtain the same control over its domain as is the case in the natural sciences. It is therefore only logical that the best strategy for the social scientist is to follow the same methodology as that of the natural scientist. This means that in both domains the aim is to establish universally valid, causal laws of human behaviour".*

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[10] Logical Positivism was the term used by Hans Hahn, a member of the Vienna Circle in the 1920s, to describe the notion that the basis of knowledge rests upon public experimental verification rather than upon personal experience. Strict logical positivists hold that any other claim for knowledge is meaningless (Babbie & Mouton, 2001:24).

[11] Falsification, which was introduced by Karl Popper, implies that an idea could not be regarded as scientific unless it was falsifiable (Remenyi *et al.*, 1998:33).

Although this approach dominated the early years of social science, by the beginning of the 20th century it became clear that there were other ways of studying organisations and individuals. Max Weber had established an alternative way of researching in the field of social science and with the publication of *The Protestant Ethic* and *The Spirit of Capitalism* in 1904, an alternative to positivistic research was beginning to be formulated (Weber, 1930). At about the same time the Chicago School of Sociology was also pioneering a non-positivistic approach to the study of sociology (Bulmer, 1984). Although this was picked up by a number of social scientists, in general, the positivist approach to research in social science remained dominant well into the second half of the 20th century.

When IS became an active field of study, positivists dominated research in this area (Orlikowski & Baroudi 1991; Wyssusek *et al.*, 2002) and, as Roode (2003) points out, in some senses still do. Exponents of positivist traditions utilise mainly quantitative research methods. Roode's (2003) view of positivism is that

> *"the positivist regards the objects of her study as exactly that viz., objects, and applies the methods and practices of the scientific method in investigating these objects with the aim of reaching valid and truthful conclusions about them, thereby contributing to knowledge that attempts to uncover universal laws to be used for predictive purposes".*

There are extensive criticisms of positivism such as that expressed by Karl Popper (cited by Sir Peter Medawar) who recalled:

> *"Boswell-like, I once asked Karl Popper to express in a sentence the quintessence of the teaching of positivism. He at once replied: 'The world is all surface'."*
>
> (Medawar, 1986).

Although the positivist view is still strongly upheld by many IS researchers, in the current era there is a much wider acceptance of

alternative philosophical views. The critique of the positivist approach gave rise to other ways of researching and understanding. One such development was that of Interpretivism.

3.4.2 Interpretivist approach

There were two separate centres where interpretivist research developed in the early part of the 20th century, one in Germany and the other in the United States of America (Koch, 1999). In Germany the influential efforts of Max Weber and German philosophical idealism helped social science establish a human-centred focus, which was not based on positivism. The Chicago School of Sociology was also influential in these developments (Bulmer, 1984), and the main research paradigm was field studies for which anthropology is well known.

This approach to research does not rely on numerical or statistical analysis of data or evidence. Interpretive researchers do not suggest that research can naturally be objective but they argue that through carefully implementing procedures such as triangulation, a large part of the bias inherent in individual researchers can be identified, and at least to some extent controlled.

This approach to research was picked up by others including Alfred Schutz (Pietrykowski, 1996; Dobson, 2001a; Ng, 2002; Vendelo, 2003) who made a major contribution to the many key ideas underpinning interpretivism which were developed during the 1940s. Whereas positivism emphasises the similarities between the objects of the natural and social sciences, the interpretivist tradition recognises the differences between them (Babbie & Mouton, 2001). Interpretivists acknowledge that the problem which they are researching exists in a social context (Jones, 2000), and that the most appropriate way of understanding social actors may not necessarily be through numbers and statistical tests. This view is expounded by Roode (2003), who avers that:

> *"The interpretivist researcher recognizes that many important problems related to the development, use and implementation of IS intimately concern people, and accepts that the social world presents a better stage to study these phenomena than the purely material world of technology. Moreover, this social world is accepted to be a human construction with many attributes that cannot be quantitatively observed and measured, and the interpretivist deliberately sets out subjectively to understand these constructs, often through active involvement, and never so-called objective, independent observation. Understanding is the main role of the interpretivist, and never prediction."*[12]

Walsham (1995:376) offers the following view of Interpretivism:

> *"Interpretive methods of research adopt the position that our knowledge of reality is a social construction by human factors. In this view, value-free data cannot be obtained, since the enquirer uses his or her preconceptions in order to guide the process of enquiry, and furthermore the researcher interacts with the human subjects of the enquiry, changing the perceptions of both parties. Interpretivism contrasts with positivism, where it is assumed that the 'objective' data collected by the researcher can be used to test prior hypotheses or theories."*

The growing interest in interpretivism among the IS research community (Markus, 1997; Myers, 1997; Khazanchi & Munkvold, 2000; Klein & Myers, 2001; Bannister, 2005) attempts to address complex issues related to the interaction between IS and management, organisation and individual behaviour. This interest may be attributed to the acceptance that IS research is essentially conducted within a social domain, e.g., organisations, users, managers, communities, governments, etc.

Interpretivism can be critiqued on many levels, e.g., although proponents argue strongly that bias should be eliminated from the research process, the reality is that this is not possible. The advent of Interpretivism has led

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[12] The use of the word "never" is interesting, coming as it does from an interpretivist.

to a number of debates with positivists, e.g., Walsham (1995), regarding the usefulness of the one or the other approach in IS research.

3.4.3 *Critical Theory*

Different to both positivism and interpretivism is another approach referred to as Critical Research. Critical social science can trace its origins back to the work the Frankfurt School, which was established in 1923 by Felix Weil (Wiggershaus, 1994). One of the aims of this school of philosophy and sociology was to overcome the limitations of positivism and interpretivism. Today the most distinguished representative of the critical school is Jürgen Habermas. Critical researchers often conduct their research in the context of Marxism, feminism, corporate power structures, anti-racism and anti-colonialism. This approach to research denies that a researcher can be objective. According to critical researchers, bias is inherent in the human condition. Therefore researchers come to their work declaring their interests, biases, and purpose or use of their research. Babbie and Mouton (2001:34) point out that the single most distinctive feature of the critical research tradition is its insistence on science, and therefore knowledge, becoming an emancipatory and transformative force in society. They further argue that critical social scientists recognise the contribution of both positivism and interpretivism, i.e., they accept the need for both causal theories based on objective observation as well as interpretive descriptions based on inter-subjective understanding.

Critical research methods are gaining a foothold among IS researchers, among whom there is a growing following for this approach (Dobson, 2001b; Mir & Watson, 2001; Carlsson, 2003; Mingers, 2003; Pozzebon 2003). This school of thought draws attention to the fact that IS are seldom, if ever, neutral in their effect on corporate power structures and on individual work patterns, remuneration and control. In fact since the early 1990s, through the ideas of Hammer and Champy (1993) and

Davenport (1997), some IS researchers have specifically designated themselves as agents and facilitators of change.[13] Such issues are well suited to the critical research approach.

3.5 Critical Realism

The foregoing discussion outlined the principal tenets of three of the more common methodological paradigms in IS research. Each of these research approaches has highly articulate critics as well as champions. In the past few years it has become increasingly obvious that no one of these positions has more privileged access to understanding than another. Often an effective way of conducting research requires a combination of approaches. This assertion is a philosophical stance in its own right and has been referred to by some as *critical realism*. The critical realist approach was pioneered by Roy Bhaskar (Bhaskar, 1975). For its intellectual underpinning, critical realism draws on concepts and tools from positivism, interpretivism and critical theory to assist the researcher (Mingers, 2002; Carlsson, 2003; Klein, 2004).

Carlsson (2003) observes that critical realism has provided an important perspective in both modern philosophy and social science. He points out that it continues to grow as an important approach in IS research. Further analysis of research reports indicates that realists seek connections among phenomena rather than formal associations or regularities (Sayer, 2000). In general, a critical realist's understanding of science takes the view that certain types of entities (be they objects, forces, social structures, or ideas) exist in the world, largely independent of human perception, and that through research we can gain reliable knowledge of them (Mingers, 2002).

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[13] Business process re-engineering which has been proposed by Hammer and Champy (1993) and followed up by Davenport (1997) could be seen in some sense as a type of action research driven by an agenda to downsize organisations. In this light it could be perceived as having a link to Critical Theory thinking.

According to Schostak (2002), a distinction is clearly made by critical realists between the world of nature and the world of society. The former is amenable to a variety of forms of experimental and statistical analysis and the latter is not. Schostak (2002) goes on to provide the following reasons for this assertion: (i) the social researcher is part of the world being studied, hence the act of researching affects what is being researched and its results change the social world (see also Ghoshal, 2005); (ii) the world of the social researcher is composed of agents who are continually constructing and de-constructing their world and their acts within the world. In short, the social world cannot be as highly controlled as the objects defined by the natural sciences.

Sayer (2000:10-12), in referring to Bhaskar's views of realism, provides a deeper explanation of Schostak's notions of the world of nature and the social world by making the distinction between the transitive and intransitive dimensions of knowledge as follows: the objects of science (physical processes or social phenomena) form the intransitive dimension of science; whereas the theories and discourse as media and resources of science are part of the transitive dimension. Various theories and the sciences from which they are derived have different transitive objects, but the world they are about (the intransitive dimension) remains the same. When transitive dimensions change, intransitive dimensions do not necessarily modify. The latter is true for the natural world. However, the social world cannot be said to exist independently of our knowledge of it. Social scientists, therefore, are cast in the role of construing rather than constructing the social world. Thus, as researchers, our views of the world should not be conflated by our experiences of it. Consequently, Sayer recommends that critical realism should not be confused with empirical realism, which connects the real with the empirical.

Mingers (2002:298-300) describes the following key characteristics of critical realism:

- Critical Realism does not have a commitment to a single form of research; rather it involves particular attitudes towards its purpose and practice. First, the critical realist is never content just with description, whether it be qualitative or quantitative. No matter how complex a statistical analysis or rich an ethnographic interpretation, this is only the first step. Critical realism wants to get beneath the surface to understand and explain why things are as they are, to hypothesise the structures and mechanisms that shape observable events.
- Critical Realism recognises the existence of a variety of objects of knowledge (material, conceptual, social, and psychological), each of which requires different research methods to come to an understanding of them, and critical realism emphasises the holistic interaction of these different objects. Thus it is expected that understanding in any particular situation will require a variety of research methods, both extensive and intensive.[14] Critical Realism recognises the inevitable fallibility of observation, especially in the social world, and therefore requires researchers to be particularly aware of the assumptions and limitations of their research.

Additionally, the following key features of Critical Realism have been summarised from Sayer (2000:10-18):

- *Causation*: One of the most distinct features of realism is its analysis of causation. Causation is *not* understood on a model of regular succession of events, and hence explanation does not depend on finding these events, or searching for social laws that are generally acceptable. What causes something to happen has nothing to do with the number of times we have observed it occurring. Explanation depends instead on identifying causal

[14] See Sayer (2000:21) for a summary of intensive and extensive methods.

mechanisms and how they work, and discovering how they are activated and the conditions under which they operate.[15]

- *Hermeneutic dimension*: Critical realism acknowledges that social phenomena are intrinsically meaningful, and hence that meaning is not only externally descriptive of them but constitutive of them. Meaning has to be understood, it cannot be measured or counted; hence there is always a hermeneutic element in social science. While natural scientists have to enter the hermeneutic circle of their scientific community, social scientists also have to enter that of those whom they study, i.e., social science operates in a double hermeneutic circle. These circles imply a two-way movement, a "fusing of horizons" of listener and speaker, researcher and researched.

3.5.1 The hermeneutic dimension of Critical Realism

Since hermeneutics could be considered as an intellectual stance in its own right, Myers (1997) is of the view that hermeneutics can be treated both as an underlying philosophy and as a specific mode of analysis. As a mode of analysis, it suggests a way of understanding textual data. The interpretation of texts is thus the point of departure (Alvesson & Sköldberg, 2000). If hermeneutic analysis is used in an IS study, the object of the interpretive effort becomes one of attempting to make sense of the organisation as a text-analogue (Myers, 1997). In an organisation different stakeholders can have confused, incomplete, cloudy and contradictory views on many issues. Myers goes on to explain that the aim of hermeneutic analysis becomes one of trying to

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[15] Of course there are those who claim that one can never prove the causal link. It is convincingly argued in *Galileo's Mistake* (Rowland, 2001) that we cannot even be certain of what is driving cause and effect. In studying causal links, observation of before and after situations is necessary, but not always sufficient. For example, it is possible that Newton may have in fact observed an apple falling onto his head, but this in itself could not have been sufficient for him to have postulated the Universal Law of Gravitation. As a Realist, I regard the empirical evidence related to the before and after as a sufficient indication of the casual relationship.

make sense of the whole, and the relationship between people, the organisation, and information technology (Myers, 1997).

Hermeneutics points out that the meaning of a part can only be understood if it is related to the whole and vice versa (Alvesson & Sköldberg, 2000). The researcher is therefore confronted with the hermeneutic circle (Klein & Myers, 1999). According to Whittaker (2004), the fundamental motivation for theoretical interpretive research is necessarily also the fundamental principle of hermeneutics, i.e., that of the hermeneutic circle in terms of which the whole receives its definition from the parts, and reciprocally the parts which can only be understood in reference to the whole. She goes on to argue that hermeneutic understanding thus operates in a circular fashion, as interplay between part and whole, in which the understanding of the part is shaped by the whole, while the whole is again shaped by the understanding of the parts. The hermeneutic circle is thus the means of operation in the process of understanding. The application of the principle of the hermeneutic circle is illustrated by Klein and Myers (1999:71):

> *"...the parts can be the interpretive researchers' and the participants' preliminary understandings in the study. The whole consists of the shared meanings that emerge from the shared interactions between them".*

Alvesson and Sköldberg (2000:52-58) distinguish between *objectivist* and *alethic* hermeneutics as follows. One of the common traits between these two traditions is their emphasis on the importance of *intuition*. This implies that knowledge is not to be acquired in the usual, reasoning and rational way. There is instead something of a privileged royal road to true knowledge of the world. This is achieved, not by laborious pondering, but rather at a stroke, whereby patterns in complex wholes are illuminated by a kind of mental flashlight giving an immediate and

complete overview.[16] Knowledge is then often experienced as self-evident. Intuition implies a kind of inner gazing, separate from the more formal and routine kind of knowledge. There are two types of intuition. The first, which is associated with objectivist hermeneutics, is the traditional *Verstehen*[17] philosophy, with its emphasis on the re-enactment of the meanings that the originators of texts and acts associate with these. It results in the understanding of underlying meaning, not the explanation of causal connection. The second is alethic hermeneutics, with its focus on truth as an act of disclosure, in which the polarity between subject and object, as well as that between understanding and explanation, is dissolved in the radical light of a more original unity. The alethic approach concerns the revelation of something hidden, rather than the correspondence between subjective thinking and objective reality.

3.5.2 Implications of Critical Realism for this research study

Having considered the foregoing discussion on Positivism, Interpretivism, and Critical Realism, and in weighing these against the research problems and questions, I am able to conclude that the critical realist paradigm is best suited as an intellectual underpinning for this study. The reasons for this are:

- Firstly, critical realism offers a way of bridging the gap which sometimes appears between researchers advocating positivistic and interpretivist research paradigms, and this is especially valuable in IS

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[16] This does not imply that knowledge is instantaneously created without any understanding or context. Rather this suggests that the *"immediate and complete overview"* is sometimes arrived at *"at a stroke"*. For example, it would be naïve to assume that Newton's law of gravity was formulated only on the basis of an apple falling on his head or that Archimedes' Principle was not previously percolating in his mind before he took his legendary bath.

[17] *Verstehen*, a word coined by Max Weber, means subjective understanding or interpretation.

research where both these groups are strongly represented and quite articulate in their arguments. Adopting a critical realist stance therefore allows me the flexibility to approach the research problem concerning ECIS success with a more open mind.

- Secondly, the notion of the transitive and intransitive dimensions of knowledge is important. As an IS researcher I should be aware of the relationship between the objects of IS studies, viz., data, information, stakeholders, hardware, software, etc., and the theories that are applied in the study of these. Taking a critical realist approach to this study would therefore imply that as the researcher I should be cognisant of the fact that I am construing rather than constructing (refer to Sayer, 2000:11) a theory regarding ECIS success. This entails that I need to be mindful of the intransitive dimensions of the study. In particular, I would have to be mindful that the views of the informants are not independent of existing knowledge and thus cannot be assumed to be unbiased or neutral.

- Thirdly, IS researchers need not be married to any particular approach to research. The critical realist utilises both quantitative and qualitative techniques, but at the same time strives to go beyond analyses, and in so doing offers deeper explanations or understanding as to why the objects of our study appear as they are. As Mingers (2000) points out, critical realism wants to get beneath the surface to understand and explain why things are as they are, and to explicate the structures and mechanisms that shape observable events. Such an approach is well suited to this study since the problems concerning ECIS success, as indicated by the literature review, are indeed complicated. A critical realist approach would therefore be supportive of using a combination of research techniques to delve beneath the surface of the empirical evidence, and obtain rich answers to the questions around ECIS success.

- Fourthly, critical realism facilitates the acknowledgement of the multi-disciplinary and the socio-technical dimensions of IS. This fits in well with the notion that the Critical Realist is aware of the existence of a variety of objects of knowledge. This acknowledgement of a multi-disciplinary view to this study is especially important, since current debates concerning IS success increasingly point to the relevance of other disciplines such as marketing (e.g., Watson *et al.*, 1998; Jiang *et al.*, 2002).

- In the fifth place, the researcher is expected to approach the observation of the objects of his study, either directly or indirectly, with caution. This implies that I would need to be wary of the fallibility of being an observer in the social setting, and in so doing keep in mind the differences between transitive and intransitive notions of knowledge.

- In the sixth place, although causation is an important issue in identifying dimensions of IS success, this study was not initiated by identifying possible dependent and independent success variables as would be the case in most positivist studies. It was not my intention to set out a series of hypotheses seeking to either prove or disprove them by gathering statistical data on regularities and repeated occurrences. Rather, in adopting the view of Sayer (2000:14), my approach would entail the development of explanations regarding the objects which possess the power to influence the success of ECIS.

3.6 Qualitative research

The next hurdle is to choose appropriate strategies with which to conduct the research, i.e., the research methods. The nature of the research problem, and the associated research questions, will

essentially drive the choice of methods. The imperatives of the critical realist tradition suggest that qualitative research methods would be a more suitable approach to select for this study. While more specific details regarding the research techniques and the analysis of the evidence are provided in Chapter Four, this section provides a *raison d'ê'tre for* the choice of qualitative-oriented tools for the research.

3.6.1 Qualitative versus quantitative design

Snape and Spencer (2003:2-3) describe qualitative research as follows:

> *"Qualitative research is a situated activity that locates the observer in the world. It consists of a set of interpretive, material practices that makes the world visible. These practices turn the world into a series of representations including fieldnotes, interviews, photographs, recordings, and memos to the self. At this level, qualitative research involves an interpretive, naturalistic approach to the world. This means that qualitative researchers study things in their natural settings, attempting to make sense of, to interpret, phenomena in terms of the meanings people bring to them".*

Quantitative research, on the other hand, is concerned with the collection and analysis of data in numeric form. This form of research tends to emphasise large data sets (Blaxter *et al.*, 2001). The quantitative researcher believes that the best way of measuring the properties of phenomena is through quantitative measurement, i.e., assigning numbers to perceived qualities of entities. The use of variables is critical in describing social phenomena (Henning, 2004), with a central role being the handling of potential sources of error either through experimental or statistical control (Babbie & Mouton, 2001).

Strauss and Corbin (1998) sum up the difference between these two paradigms by suggesting that the term qualitative research implies any type of research that produces findings not arrived at by statistical procedures or other means of quantification.

3.6.2 Justifying the choice of a qualitatively aligned design

Quoting directly from Kant, Snape and Spencer (2003:6-7)[18] posit that the early ideas now associated with qualitative research can be linked to the writings of Immanuel Kant who proposed that:

> *"Perception relates not only to senses but to human interpretations of what our senses tell us; our knowledge of the world is based on understanding which arises from thinking about what happens to us, not just simply from having had particular experiences; knowing and knowledge transcend basic empirical enquiry; distinctions exist between scientific reason (based strictly on causal determinism) and practical reason (based on moral freedom and decision-making which involves less certainty)".*

These ideas of Kant strongly support the tenets of critical realism. A consideration of the main features of both quantitative and qualitative research approaches indicates that a qualitative paradigm is more closely aligned with a critical realist stance for the following reasons:

- Qualitative research is often less structured than other kinds of social research in that the researcher initiates a study with a certain degree of openness to the research subject and what may be learned from it (Ragin, 1994).
- Qualitative research involves the use of data, such as interviews, documents, and participant observation data, to understand and explain social phenomena. The use of such data is in keeping with the Critical Realist tradition of being able to offer deep explanations of the objects of the inquiry.
- The amenability of a Critical Realist approach to multidisciplinary studies has been pointed out. Qualitative researchers can be found in many disciplines and fields, using a variety of approaches, methods and techniques. In IS research, there has been a general

[18] Their summary of qualitative research is based on Immanuel Kant's *Critique of Pure Reason* which was first published in 1781.

shift away from technical problems towards managerial and organisational issues, Hence there is an increasing interest in the application of qualitative research methods (Myers, 1997).

Moreover, the basic tenets of qualitative research such as those described by Snape and Spencer (2003:3-4) below, further support the appropriateness of such an approach:

- Research aims are directed at providing an in-depth and interpreted understanding of the social world of research participants by learning about their social and material circumstances, their experiences and histories.
- Samples are small in scale and purposively selected on the basis of salient criteria.
- Data collection methods usually involve close contact between the researcher and the research participants. This results in an interactive and developmental relationship, which facilitates the exploration of emergent issues.
- Data is detailed, information-rich and extensive.
- Analysis is open to emergent concepts and ideas, which may produce detailed descriptions, and classifications. This enhances the identification of patterns of association, and the development of typologies and explanations.
- Outputs tend to focus on the interpretation of social meaning through mapping and "re-presenting" the social world of research participants.

Babbie and Mouton (2001:270) provide a list of distinguishing features of the qualitative paradigm. The relevant features of this list are enumerated in Table 3.1, and the appropriate context of this study in respect of each of these is explained.

Table 3.1: Aligning the qualitative paradigm with key aspects of the study

	Key feature of qualitative research	Relevance to the proposed study	Importance
1.	*Research is conducted in the natural setting of the social actors*	It is envisaged that evidence will be collected from amongst e-Commerce business stakeholders. These will be done mainly at the premises of these businesses.	Medium
2.	*A focus on process rather than outcome*	The main outcome of this study is a theory regarding ECIS success. The process of conducting the research is seen as more important than the outcome, as the theory is being grounded in the evidence. The process is therefore important, so as to ensure that the outcome is valid.	High
3.	*The actor's perspective is emphasised*	Since no single underlying theory is used to frame the study, the perspective of the research subjects (e-Commerce managers) is emphasised.	High
4.	*The primary aim is in-depth descriptions and understanding of actions and events.*	With each interaction with the informants, the aim will be to elicit in-depth descriptions which will continually be analysed and refined to extract important aspects of the theory being developed.	High
5.	*The main concern is to understand social action in terms of its specific context rather than attempting to generalise to some theoretical population.*	In interacting with the informants, my primary aim is to obtain an in-depth understanding of the practice of e-Commerce in the context of the research settings of the selected businesses. While it is envisaged that the evolving theory would be applicable to e-Commerce businesses in South Africa, the aim is not to generalise, but rather to contribute to an improved understanding of ECIS success.	High
6.	*The research process is often inductive in its approach, resulting in the generation of new hypotheses and theories.*	The proposed study is seen as inductive in that by thickly describing events from the natural setting, and through continuous refinement, the resultant theory emerges.	High
7.	*The qualitative researcher is seen as the "main instrument" in the research process.*	The choice of methods to collect evidence, viz., interviews, implies that the researcher is the main instrument of the research process.	High

3.7 Strategies for conducting qualitative research

Research methods focus on the research process and the kind of tools and procedures to be used. The focus is on the individual steps in the research process and the most objective unbiased procedures to be employed. In this section an overview is presented as to why certain strategies were employed in this study.

The qualitative researcher has various research design options available to him. Examples of these options are action research, case studies, ethnography, and in-depth surveys.[19] Having chosen an appropriate design, the researcher then has to select the methods that will be employed within the ambit of the chosen design. Examples of methods available to qualitative researchers are interviewing, observation, document analysis (Denscombe, 2003), focus groups and observation (Henning, 2004). All of these methods have been utilised in various IS studies (Galliers, 1992; Myers, 1997).

3.7.1 The in-depth survey & the use of the interview technique

The choice of the design is determined by a number of factors such as the research questions, the costs or budget available to the researchers, the time available, the initial target date for completion, and the skills of the researcher. In the case of this study, the philosophical underpinnings and the nature of the research questions were also factors that influenced the choice of a qualitative design. Having considered a variety of design types in a number of research texts and research papers, the in-depth survey (Remenyi *et al.*, 1998)[20] offered the best means to gather the required evidence, while adhering to the basic

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[19] Refer to Remenyi *et al.* (1998) and Babbie and Mouton (2001) for a more detailed account of each of these design types.

[20] Although the term *survey* is usually associated with quantitative research, these authors, through the conjugation of *survey* with the term *in-depth*, have brought it into the fold of qualitative methodology.

tenets espoused by the critical realist tradition. According to these authors, method generally attempts to obtain detailed in-depth evidence from a relatively small number of informants through a series of interviews.

The use of the in-depth survey strongly supported the goals of the qualitative methodological paradigm in that it allowed me to obtain an insider perspective of the e-Commerce businesses that were sampled. In adopting this approach, I was able to make progress in investigating the research problem on the basis of describing and understanding, or *Verstehen*, rather than that of explanation and prediction of human behaviour.

In reflecting on the research questions, as well the in-depth literature review, it was clear that in order to develop a theory, I would need to get a first-hand perspective of the business and the management issues that had a bearing on ECIS success. An "*insider perspective*" (Babbie & Mouton, 2001) would provide a sufficient enough understanding of the research issues to enable me to achieve this goal. Furthermore, this insider perspective was necessary, as I did not identify any suitable theory from the extant literature, to guide the research.

Various options such as implementing a structured questionnaire, using focus groups, and conducting interviews, were considered in respect of getting such an insider perspective. In keeping with the tenets of the realist tradition, I opted to use semi-structured interviews as the primary technique for gathering evidence. Moreover, the interview technique is widely accepted in social research practice as a means of gathering evidence (Pawson & Tilley, 1997; Travers, 2001; Henning, 2004) especially in the qualitative tradition (Myers, 1997). There are also several IS studies at doctoral level that have used the interview technique, e.g., Lubbe (1997), Bannister (2001), Griffiths (2005).

The *semi-structured interview technique* was chosen for this study precisely because of the nature of the research problem. Given the complexity of the questions around what constituted ECIS success, it was difficult to approach the informants with a rigid set of pre-determined questions. To do this meant that the informants might possibly direct their thoughts only to the questions posed by the researcher.

In the semi-structured interview, a structured questionnaire is not used, as is the case in traditional surveys, but rather the informant is allowed to speak more freely on the subject matter of interest to the researcher, with an interview protocol being used to guide the discussion (Denscombe, 2003). Interviewees therefore are able to speak for themselves, rather than respond to a battery of the researcher's own pre-determined hypothesis-based questions (Babbie & Mouton, 2001). Rubin and Rubin (1995) advise that qualitative interview design is characterised by being flexible, iterative and continuous, rather than prepared in advance and locked in stone. This technique for evidence collection thus served this research well.

In social research, the evidence that is required does not lie around waiting to be gathered like shells on the seashore. Rather, as Klein and Myers (1999:74) maintain, the facts are produced as intrinsic to the social interaction of the researcher with the knowledgeable informants. Kvale (1996:3-5) offers two metaphors for interviewing: the interviewer as a *miner* or as a *traveller*. The first model assumes that the subject possesses specific information and that the interviewer's job is to extract it. By contrast, in the second model, the interviewer

> "*...wanders through the landscape and enters through conversations with the people encountered. The traveller explores the many domains of the country, as unknown territory or with maps, roaming freely around the territory...The interviewer wanders along with the local inhabitants, asks questions that lead the subjects to tell their own stories of their lived world*".
>
> (Kvale, 1996:4)

Following on Kvale's metaphorical description of the interviewer, I adopted the traveller model in the conduct of this research, as it is suitable to the Critical Realist paradigm, especially the hermeneutical dimension, described above.

3.8 A strategy for developing the theory

Having decided on the use of semi-structured interviews to gather evidence, the next research design consideration focuses on the main aim of the study, viz., the development of an ECIS success theory. To this end, in the following two sections, various definitions of theory are discussed, followed by an overview of a theory development strategy.

3.8.1 What is theory?

According to Denscombe (2003:123), there are two kinds of theory that can be developed:

> *"The first is linked closely to the empirical situation that has been the subject of study. It is a fairly localized kind of theory and is known as* substantive theory. *The other kind of theory is more conceptual, with more general coverage, and application to circumstances beyond particular settings. This is known as* formal theory. *Substantive theory, is closely linked to practice, interaction, and specific kinds of settings, whereas when we speak of formal theory, we usually refer to those areas of generality, such as systems theory, agency theory, population ecology, and contingency theory".*

Accordingly, the type of theory being developed for this study may be referred to as substantive theory. There are a number of explanations and definitions of substantive theory in the literature. For example, Strauss and Corbin (1998:22) propose that

> *"a theory denotes a set of well-developed categories (e.g., themes, concepts) that are systematically inter-related through statements of relationships to form a theoretical framework that explains some relevant social or other phenomenon".*

In supporting their definition of a theory, Strauss and Corbin argue that theoretical frameworks such as feminism, structuralism, or interactionism[21] are not theories as such. They are "*a stance, and more of a philosophy*" rather than "*a well-developed and related set of explanatory concepts about how the world works*" (Strauss & Corbin, 1998:24). Bannister and co-authors' definition of a theory is not too dissimilar from that of Strauss and Corbin. They propose that

> *"a theory is systematically organized descriptive and/or explanatory knowledge applicable in a relatively wide variety of circumstances, using a system of assumptions, accepted principles, and rules of procedure devised to analyze, predict, or otherwise explain the nature or behaviour of a specified set of phenomena. But it is also often simply the best explanation, which is available at that time".*
>
> (Bannister et al., 2006:39)

Hughes (2003), in discussing theory after Dey (1999:1-2), offers some advice regarding how evidence could be collected:

> *"theory focuses on how individuals interact in relation to the phenomenon under study; it asserts a plausible relation between concepts and sets of concepts; it is derived from data acquired through fieldwork interviews, observations and documents; the resulting theory can be reported in a narrative framework or as a set of propositions".*

These definitions provided an important foundation that guided the strategy for theory development.

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[21] Sometimes also referred to as grand theories.

3.8.2 A framework for theory development: from narrative to paradigm

There are a number of examples of research both within the IS field (e.g., Orlikowski, 1993; Correia & Wilson, 1997; Whittaker, 2004; Bannister *et al.*, 2006; Remenyi & Money, 2006) and in the general body of literature (e.g., Yin, 1994; Kvale, 1996; Strauss & Corbin, 1998) that offer varied insights into approaches for theory development. Having considered, the elements of the research design, I adopted a strategy proposed by Remenyi *et al.* (1998:121-125), which is depicted in Figure 3.3.

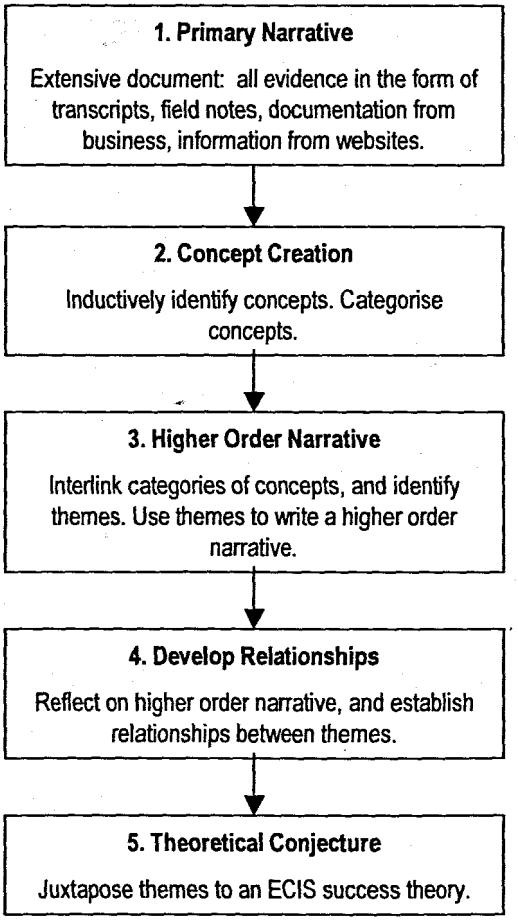

Figure 3.3: A framework for the development of theory: from the narrative to the theoretical conjecture
(Adapted from Remenyi *et al.*, 1998:123)

These authors maintain that the scientific process involves a transition from narrative-thinking to paradigmatic-thinking. They describe these two ways of thinking as follows:

> *"Narrative thinking involves the construction of a consistent and convincing description of the processes or subject matter under investigation. Paradigmatic thinking on the other hand involves the constructions of laws, rules or conjectures from which it is hoped deductions can be made that can be tested against the evidence or observations. The construction of the narrative will depend largely on the qualitative information that is made available... It is possible to regard narrative thought and paradigmatic thought as two poles of a continuum along which the ideas are refined from descriptive generalisations to quite specific statements of relationships."*
>
> (Remenyi *et al.*, 1998:121)

They further propound that creativity in research[22] lies primarily in the narrative mode of thinking which dominates the five steps depicted in Figure 3.3, and it is mostly here that new discoveries are made and innovative ideas developed. This approach thus underscores the development of a narrative in the process of theory development. It is possible to regard narrative thought and paradigmatic thought as two poles of a continuum along which ideas are refined from descriptive generalisations to specific statements of relationships. It is therefore suggested that researchers, in working within this continuum, have to be creative and should not limit their thinking by adhering too strictly to any given method. Instead researchers should be open to a high degree of flexibility and creativity in their approach.

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[22] The requirement of creativity on the part of the researcher is also supported by other researchers such as Sandelowski (1995), Strauss and Corbin (1998) and Alvesson and Sköldberg (2000).

3.9 Evaluation of qualitative research

The final component of the research design is concerned with the approaches that could be taken in evaluating the outcomes of this study. In evaluating research generally, a number of questions are usually asked, one of which is, *"Are the research findings reliable and valid, and can they be generalised?"* The answer this question has provoked a great deal of debate within the academic community, especially since qualitative and quantitative researchers have different views on this subject. Many qualitative researchers maintain that the canons by which quantitative studies are judged are quite inappropriate for judging the merit of qualitative studies (Kvale, 1996; Mason, 2002; Lewis & Ritchie, 2003; Henning, 2004). Kvale (1996:229) sums up the position of many qualitative researchers, in a somewhat cynical swipe at the positivist view on this subject:

> *"In modern social science the concepts of generalizability, reliability and validity have reached the status of a scientific holy trinity. They appear to belong to some abstract realm in a sanctuary of science far removed from the interactions of the everyday world, and to be worshipped with respect by all true believers in science."*

Strauss and Corbin (1998) argue that the usual canons of research have value but require redefinition to fit the realities of qualitative research and the complexities of the social phenomena that researchers seek to understand.[23] Qualitative researchers are expected to guard against the dangers derived from adherence to the more positivistic interpretations of these canons.

There is no one best way to demonstrate or evaluate qualitative research (Henning, 2004), and several approaches have been identified

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[23] The usual scientific canons include significance, theory observation compatibility, generalisability, consistency, reproducibility, precision and verification (Strauss & Corbin, 1998:266).

in the literature. Table 3.2 contrasts some of the more frequently used approaches used in the quantitative tradition with those used in qualitative research.

Table 3.2: A comparison of quantitative and qualitative research evaluation strategies

Quantitative	Qualitative
Objectivity	Confirmability
Internal validity	Credibility
Generalisability or External validity	Transferability
Reliability	Dependability

3.9.1 Confirmability

The term "confirmability", as opposed to "objectivity", is used by qualitative researchers to discuss issues such as reliability and validity. Reliability is generally understood to concern the replicability of research and the obtaining of similar findings if another study using the same methods was undertaken (Lewis & Ritchie, 2003). Validity, according to Kvale (1996:238), pertains to *"the degree that a method investigates what it is intended to investigate, to the extent to which our observations indeed reflect the phenomena or variables of interest to us".*

The concepts of reliability and validity were developed in the natural sciences (Lewis & Ritchie, 2003). These authors argue that because of this, and the different epistemological basis of qualitative research, there are real concerns about whether the same concepts have any value in determining the quality or sustainability of qualitative findings. Tests or measures of reliability and validity, as used in mathematical or physical sciences, are inappropriate for qualitative investigation and cause confusion when applied. But in their broadest conception, reliability meaning "sustainable", and validity meaning "well grounded", will have relevance for qualitative research since they help to define the strength

of the evidence (Lewis & Ritchie, 2003:270). Some sociologists, however, argue that there is no single reality to be captured in the first place, and therefore replication is an artificial goal to pursue. For example, Bannister (2005:13-14) defines two types of reality, viz., external reality (what actually happens in the social world) and internal reality (subjective reality in the minds of social actors). Therefore, in discussing reliability and validity, qualitative researchers are interested in the "confirmability" of findings (Lewis & Ritchie, 2003:270-271). Confirmability of qualitative research can be assessed through examining credibility, transferability, and dependability.

3.9.2 Transferability

Lewis and Ritchie (2003:265) posit that inferential generalisation, or transferability, is more appropriate to the qualitative paradigm than "generalisability". Transferability, according to Babbie and Mouton (2001:277), refers to the extent to which the research findings can be applied in other contexts or with other respondents. They propose the following strategies for transferability:

- *Thick description:* The researcher collects sufficiently detailed descriptions of evidence in context, and reports them, with sufficient detail and precision, to allow judgements about transferability to be made by the reader. This judgement, according to Lewis and Ritchie (2003:268), *"remains as a hypothesis until proved or disproved by further evidence"*.
- *Purposive selection of informants:* In contrast to random sampling, which is frequently used in quantitative studies, qualitative research seeks to maximise the range of specific information that can be obtained from and about the research context, by purposively selecting locations and informants that may differ from one another or be similar to one another.

3.9.3 Credibility

According to Babbbie and Mouton (2001:277), credibility refers to *"the compatibility between the constructed realities that exist in the minds of the respondents and those that are attributed to them"*. There are numerous strategies that facilitate the credibility of qualitative research, of which the most well known is that of triangulation.

Triangulation is a term that was first used in connection with the validity of measurements derived from structured quantitative data (Ritchie, 2003). On the other hand, in qualitative research, triangulation involves the use of different methods and sources to check the integrity of, or extend inferences drawn, from the data. It has been widely adopted and developed as a concept by qualitative researchers as a means of investigating the "convergence" of both data and the conclusions derived from them (Denzin, 1994). The value of triangulation lies in extending understanding, or adding breadth and depth to our analysis, through the use of multiple perspectives (Ritchie, 2003:43-44). Ritchie thus concludes that the security that triangulation provides is through giving a fuller picture of phenomena, not necessarily a more certain one.

The term "triangulation" is considered problematic by some authors. Henning (2004:103), for example, argues that the term "triangulation" ought to be used with caution as

> *"it has limitations as a metaphor and does not fit the qualitative methodology, which has more to do with 'interpreting and sourcing in various ways' to build a complete picture or text, than with calculating a position from three vantage points".*

Alvesson and Sköldberg (2000:46-47) point out that although the intention of triangulating is to "*home in*" on the phenomenon to be studied, in practice this may not be possible since

> *"different methods capture different kinds of aspects* [of a study] *making it difficult on the basis of their combination, to reach a coherent result, and therefore in reality, methodological triangulation could result in 'homing out' on the phenomenon being studied".*

Given the foregoing, qualitative researchers ought to be guarded as to how they use "triangulation". Moreover, they should be aware that it has originated from the positivist school of thought.

In addition to triangulation, Babbie and Mouton (2001:277) suggest that the following strategies will enhance the credibility of qualitative research:

- *Referential adequacy*: This relates to being able to prove the existence of the evidence that has been collected. Audio or video recordings could be used in this regard.
- *Member checks*: This involves going back to the informants to verify the researcher's interpretation of the evidence. Henning (2004:149)[24] refers to this as "*dialoguing the knowledge*", and suggests that the researchers could also use platforms such as symposia, conferences, colloquia etc., to enhance credibility.

3.9.4 Dependability

The positivist construct of reliability, which assumes unchanging conditions that enable replication of the study, does not hold for non-positivist research (Remenyi *et al.*,1998:117). In qualitative research therefore, the dependability of the research, as opposed to reliability, is used as a basis of evaluation. The use of an audit trail (Babbie & Mouton, 2001:278) is one strategy to demonstrate dependability.

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[24] Henning also points out that this is not a new idea and has been theorised by most qualitative research authors.

Remenyi *et al.* (1998:116) describe two ways in which this can be achieved:

- By keeping the evidence collected in an easily retrievable form, to enable others to investigate it should doubts regarding the research ever be raised.
- The researchers should keep a log cataloguing research design decisions and justifications for these.

3.9.5 A research evaluation framework for this study

Based on the discussions in this section, Table 3.3 outlines a framework for enhancing the confirmability of research outcomes of this study.

Table 3.3: A framework for enhancing the quality of the research outcomes

Research Quality Imperatives	Strategies
Credibility	▪ *Triangulation*: Use of multiple sources of evidence and research methods. ▪ *Referential adequacy*: Recording evidence. ▪ *Member checks*: Confirming evidence and research methods with informants and academic community.
Transferability	▪ *Thick descriptions*: Report findings with sufficient detailed description ▪ *Selecting informants purposively*
Dependability	▪ *Audit trail:* Ensure evidence is accessible to evaluators of the study. Maintain log of research design decisions.

3.10 Conclusion

In this chapter, I have undertaken the following:

- In the introduction to this chapter, I used the Three World Framework (Figure 3.1) to indicate the inter-relationships between research philosophy (metaphysical world), research approaches and techniques (world of science) and the everyday world (the world of the research problem).

- In the light of a number of questions raised in the literature regarding whether the study of IS is a valid scientific pursuit, I examined, in Section 3.3, the nature of the field of IS. I also placed the study of IS within a social science context. From this discussion I concluded that IS research, and hence this study, is indeed a valid scientific persuasion.
- In Section 3.4, I compared and contrasted various philosophical underpinnings in Social Science research. In so doing I substantiated in Section 3.5 why the Critical Realist paradigm is an appropriate intellectual underpinning for this study.
- In Sections 3.6 and 3.7, I concluded that the use of a qualitative approach would be best suited to this research. I furthermore argued that the use of semi-structured interviews is the best possible means to gather the necessary evidence for this study.
- In Section 3.8, I presented a framework for the development of an ECIS success theory.
- Lastly, in Section 3.9, I presented a framework to guide the outcomes of the empirical work towards an acceptable quality in terms of credibility, transferability, and dependability.

The synthesis of all of the above issues forms the basis of the research design of this study. The three-world framework (Babbie & Mouton, 2001) is used to represent the main tenets of this design (refer to Figure 3.4).

Figure 3.4/...

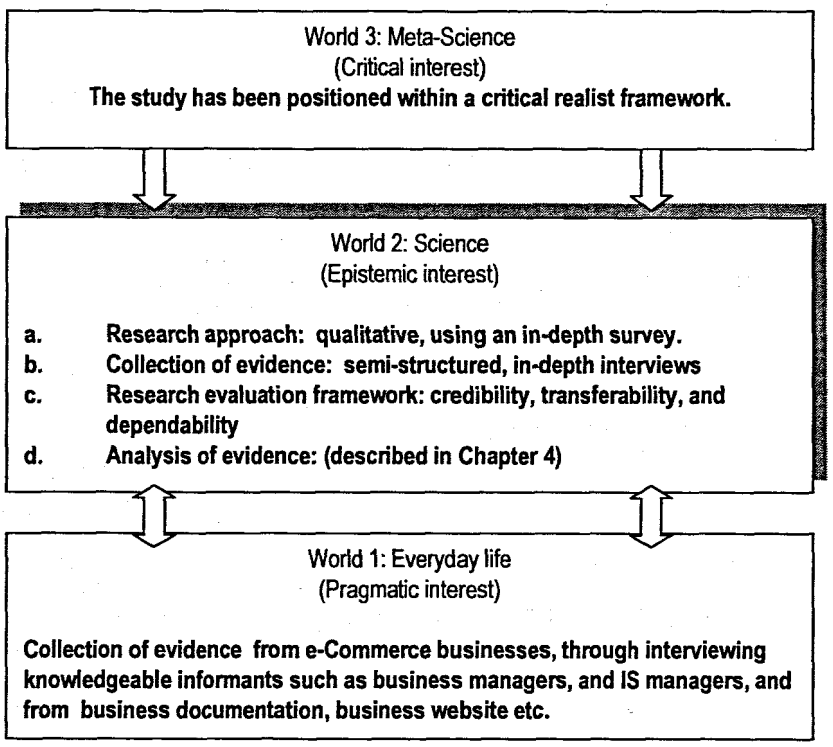

Figure 3.4: The research design

With the research design in place, the next logical step of the research process involved the execution of the fieldwork, and the analysis of evidence, which is discussed in the following chapter.

CHAPTER FOUR

STRATEGIES FOR THE COLLECTION AND ANALYSIS OF EVIDENCE

Science works with concepts of averages that are far too general to do justice to the subjective variety of an individual life.

(Jung, 1995)

Overview

At the heart of conducting an empirical study are the methods involved in the collection and analyses of evidence. The objective of this chapter is to discuss the implementation of these methods. The chapter firstly discusses how evidence was collected through semi-structured interviews. This includes an overview of how I selected knowledgeable informants from South African e-Commerce businesses. The next section of the chapter discusses techniques for analysis, and concludes that the best approach to take is to adapt the grounded theory method and apply both hermeneutical and reflexive interpretation. Following on this, details of the analysis are presented. I describe how analysis proceeded from inductive identification of concepts, to a higher- order narrative. Thereafter, I discuss how a computer-aided qualitative data analysis software (CAQDAS) package was used to facilitate the manipulation and interpretation of the evidence. Lastly, an overview is presented of the three main phases of the research.

4.1 Introduction

In a scientific inquiry, observation and interpretation are of necessity conducted within a set of guidelines (Babbie & Mouton, 2001:72). Having set out these guidelines in the previous chapter, the next step of the inquiry involves the implementation of the research. This focuses on the strategies and procedures involved in the selection of informants, evidence collection techniques, and approaches to the analysis of the evidence. The implementation of these strategies is directed at finding scientifically acceptable responses to the research questions.

4.2 The research questions and objectives

The research strategies had to facilitate the following objectives of the study:

- to enable a better understanding of the factors impacting on ECIS success;
- to explicate the central constructs and concepts associated with ECIS success; and
- to develop an ECIS success theory.

These objectives underpin the research questions. The questions were refined after an initial phase of fieldwork during which I consulted with several knowledgeable informants.[1] What was clear from these discussions was that the pervasiveness of ECIS warranted a deeper understanding of internal business processes. The questions concerning ECIS success thus required a focus on the internal management perspectives. A deeper understanding, as opposed to a narrow investigation on any one possible ECIS success issue, was required. The research questions were subsequently formulated as follows:

In the selected e-Commerce environments:

1. How does ECIS contribute to successful business?
2. What are the drivers of ECIS success and how do they relate to one another?
3. What are the important management issues that affect the success of ECIS?

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[1] The term "informant" is used in this study, as opposed to "respondent". Knowledgeable informants are the social actors who, on the basis of their extensive experience within a particular setting, provide rich, detailed information to the qualitative researcher. Refer to Kvale (1996:218-220) and Babbie and Mouton (2001:168) for a more detailed discussion on the role of informants in qualitative research.

4.3 Selection of research informants

The broader grouping from which informants were to be selected was defined as follows:

The research population constitutes knowledgeable informants in e-Commerce businesses who have an in-depth understanding of the management of business operations. These informants would usually be vested with the responsibility for the successful outcome of the e-Commerce initiatives.

Based on the above, the following categories of informants were identified:

- Managers of e-Commerce businesses who oversee operations and have either direct or indirect responsibility for the online products and services.
- IS or IT managers involved in the development, maintenance and support of ECIS.
- A third category of informants was identified during interviews, viz., managers who had experience as both IT and business managers.

I also extended this primary group of informants to include four consultants who had experience of e-Commerce businesses. Although they were not based in any single business operation, they were identified as a rich[2] source of evidence. Consultants presented a broader range of e-Commerce experiences, as compared with the average manager who was associated with just one business. They therefore were able to provide "*insight-stimulating examples*" (Selltiz *et al.*, 1965) of ECIS success. Table 4.1 provides an overview of the background of the informants.

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[2] See Charmaz (2006:13-41) for a discussion of the concept of *rich* data.

Table 4.1: Background of informants

Area of experience	No.	%
Business	29	45%
IT	22	34%
Business & IT combined experience	7	11%
Academic (interviewed in final phase for research evaluation only)	7	11%
TOTAL	**65**	**100%**

One of the key elements of qualitative research entails working with a small number of informants who are purposively selected on the basis of salient criteria. Such selection entails selecting typical or interesting cases (Blaxter *et al.*, 2001). Babbie and Mouton (2001:166) affirm that it is appropriate for the researcher to select informants on the basis of his own knowledge of the population, its elements, and the nature of the research aims.

As my aim was to understand successful implementation of ECIS, I sought out specific instances of business excellence in the field. I also took into account the size of the business (refer to Table 4.2).

Table 4.2: Number of businesses involved in the study according to size

Size of business	No.	%
Small	14	39%
Medium	8	22%
Large	14	39%
TOTAL	**36**	100%

Initially I identified informants in well-known South African businesses[3] that had successfully adopted e-Commerce. Of the 36 businesses from which informants were selected, seven have been identified in a recent report[4] as being among the top ten online retailers in South Africa, viz., Pick 'n Pay Home Shopping, Woolworths, Kalahari.net, Exclusive Books, Cybercellar, Netflorist, and Digital Planet. The informants whom I interviewed also made suggestions regarding other candidates they believed would be able to contribute valuable insights to the study.[5]

I was also aware that the main concepts, or building blocks of the theory, would be discovered incrementally, as the process of analysis unfolded. Thus, as new concepts emerged, I needed to direct my attention to businesses that would provide me with more information, especially with regard to those concepts that needed further exploration and refinement. This is known as theoretical sampling, which is defined as

> *"...the process of data collection for generating theory whereby the analyst jointly collects, codes and analyses his data and decides what data to collect next and where to find them, in order to develop his theory as it emerges. The process of data collection is controlled by the emerging theory, whether substantive or formal".*
>
> Glaser and Strauss (1967:45)

For example, during the early stages of analysis, concepts were grouped into a category named "*customer-satisfaction*". However, these concepts needed further refinement and understanding. As a result, the next informant that I sought out was a manager of an e-Commerce business that had implemented customer-satisfaction evaluation strategies.

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[3] This was based on two studies of e-Commerce activity in South Africa, viz., Goldstuck (2002) and World Wide Worx (2004).

[4] A recent study of online retail activity in South Africa (Goldstuck *et al.*, 2006:5) identified the top ten online retailing businesses in South Africa.

[5] This is sometimes also referred to as a snowballing technique (Blaxter *et al.*, 2001).

Lastly, other criteria that influenced the selection of informants included:

- Enculturation: this implies that the informant should have been sufficiently exposed or encultured to the practice of e-Commerce business.
- Current involvement: the informant would have to be currently or recently involved with e-Commerce business activities.
- Adequate time: the informant would have to be in a position to spare the time to contribute to the research, via the interview. [6]

4.4 Using the interview technique to gather evidence for the primary narrative

The interviews formed a fundamental component of the evidence-gathering activity. The following sections discuss how I made contact with the informants, the drawing up of the interview schedule, the conduct of the interview, and the recording and transcription of the evidence.

4.4.1 Making initial contact

Cooper and Schindler (2003) recommend that some of the prerequisites for an interviewer should include sound communication skills, flexible schedules, willingness to tolerate intermittent work hours, and mobility. Although there were many difficulties in meeting all of these, I was able to conduct a sufficient number of interviews before a point of theoretical saturation[7] was reached.

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[6] Refer to Spradely (1979) for a more detailed discussion of each of these bulleted points.

[7] Theoretical saturation is when the researcher reaches a point where collecting additional data is counterproductive, i.e., no new concepts and categories emerge during the coding process (Strauss & Corbin, 1998:136).

Once I had identified a business, I would communicate either through email or telephonically to establish the name of an informant. Fontana and Frey (1994) suggest that it is important to establish rapport with informants. Thus, wherever possible, telephonic communication was the preferred means to establish contact prior to a formal meeting. Moreover, I found that potential informants responded more positively to an emailed request for an interview after I had verbally outlined the purpose of the meeting. An example of an email request for the interview is provided in Appendix A. I developed standardised email content, and then modified this for each recipient, depending on the nature of what was discussed telephonically. A description of the project was also emailed to the prospective informant (see Appendix B).

4.4.2 The interview schedule

In keeping with the model of the researcher as a traveller (Kvale, 1996), the interview schedule (refer to Appendix C) did not consist of a detailed series of structured questions that were to be rigidly followed during the meeting. The interview, which was semi-structured, was conducted using the following guidelines proposed by Struwig and Stead (2001:98-99):

- The interviews were guided by the interview schedule consisting of questions that were used to direct the discussions with informants.
- Informants were allowed to go into more detail on those issues they considered to be important to ECIS success. The depth of each aspect of the topic covered was therefore dependent on each informant.
- I did not impose my viewpoint on the interviewees. Instead I assumed a passive role,[8] but probed when I thought it was necessary or if I felt that the informant was reticent. This was an

[8] Lofland and Lofland (1995) describe this aspect of the interviewing technique in more detail.

especially useful strategy, as the informants usually were more open and offered more depth of information.

4.4.3 Conducting the interview

After some introductory remarks, I usually posed the following to the interviewee to prompt the commencement of the interview:

> *"I would like hear your perspectives, as to what you consider as being the important issues with regard to being successful in e-Commerce. Specifically, how do you determine if the Information Systems deployed in this business are effectively serving your business objectives?"*

The length of the interview was dependent on the time the informant had available. On average, most interviews were an hour in duration.

After seeking permission from the informant, I tape-recorded the interview.[9] In keeping with the requirements of the university ethics committee, each informant received a signed letter, on a university letterhead, that gave an undertaking that the interview was being conducted in confidence, and that the recording was to be used solely for the purposes of the research. (Refer to Appendix D.)

In addition to the tape-recording, I also made detailed field notes while the interview was taking place. Appendix E provides an example of field notes. According to Babbie and Mouton (2001), extensive field notes are an important aspect of enhancing the credibility of research undertaken within the qualitative paradigm. The review of both extensive notes of interviews, as well as actual transcripts of the interviews, served to obtain a more in-depth and accurate understanding of the interactions

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[9] There were four interviewees who preferred that the interview not be recorded. There were also occasions when I was asked to switch off the recording device, as the interviewee wished to make a point off the record.

with the informants, e.g., a transcript will not show that a business manager's facial expression was negative when speaking about high volumes of on-line customer complaints that needed responses. The field notes also served as a means of crosschecking my interpretations of the transcribed discussions.

4.4.4 Transcription of the interviews

After each interview was conducted, the recordings were transcribed. The transcribing procedures involved three steps to ensure a high quality transcript. After an initial transcription of the interviews, the tape and the first version of the recording were given to a colleague who listened to the tape and checked for inaccuracies. Thereafter, before coding the transcripts and field notes, I listened to the tapes again to ensure accuracy. The transcriptions and the field notes were used as a basis for developing the higher-order narrative. During the process of coding, it was often necessary to listen to parts of the tape for a third time, especially in instances where there was some possible ambiguity in the transcribed text. I also discovered that by listening to the recording during coding, I was able to mentally recreate the interview setting. This served to enrich my interpretation of the evidence.

4.4.5 Interviews in three phases of the study

A total of 65 interviews were conducted. Interviews were conducted at the three major centres in South Africa, viz., Cape Town, Johannesburg and Durban, and took place mainly at the business premises of the participants. There were a few informants that preferred to meet at a neutral venue such as a coffee shop. The evidence was collected over a three-year period, between March 2003 and November 2005. Appendix F provides a detailed schedule of the dates of the interviews, together

with pertinent details of the interviewees and the business sector to which they belonged.[10]

In all there were three phases of the study during which interviews took place:

- During the exploratory phase of the research, I undertook a series of eight interviews between March 2003 and June 2003. In addition to this, I also conducted a focus group and knowledge café session with two groups of informants. The primary purpose of the exploratory phase of the study was to verify the research problem, and to refine the research questions.
- The main body of evidence was compiled between June 2003 and December 2005, during which I conducted 43 interviews. This also included conducting a case study of the well known South African e-Tailer, Kalahari.net™, as a case study to assist in identifying initial concepts related to ECIS success.
- I revisited a final group of seven informants between July and September 2006, for the purposes of refining and confirming the findings. In addition to these informants, I also conducted seven interviews with academics from both South African and overseas universities as part of the strategy to improve the credibility of the research.

4.5 Analysing the evidence

The next important consideration involved analysing the evidence in order to identify relevant concepts for the primary narrative (step 2 of the theory development strategy). In addition to the interview transcripts, the

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[10] Note that a commitment of confidentiality was given to each informant. Therefore pseudonyms are used in the reporting of this research. Furthermore, only a description of the business is provided. A full list of businesses that participated in the study is provided in the acknowledgments section at the beginning of the thesis. Actual names of informants, and the businesses they represent, can be made available for an audit if necessary.

evidence also included summaries of field notes, and pertinent documentation regarding each business. This documentation was either gleaned from the business website or was in the form of documentation provided by the informant (see Appendix L for an example of this documentation). Figure 4.1 shows the different sources of evidence, and how they relate to one another.

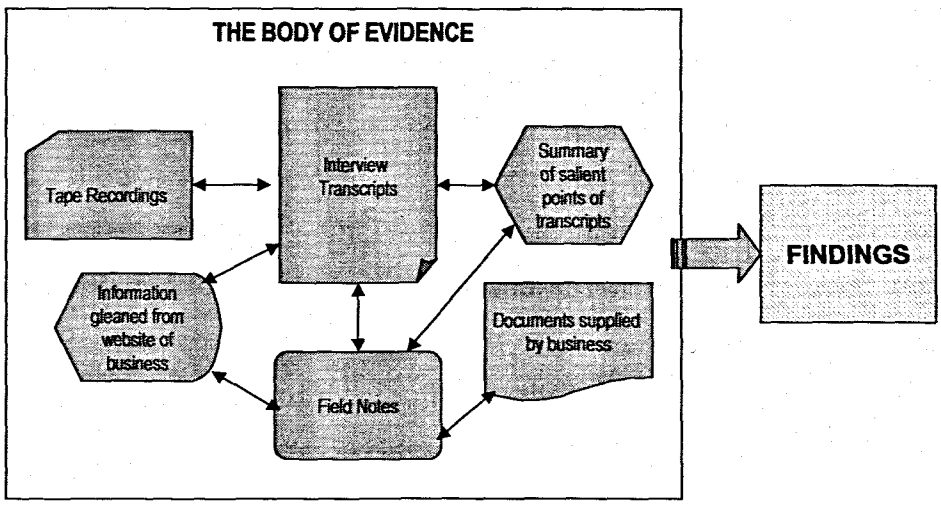

Figure 4.1: The different sources of evidence used in the study

Analysis involves the interplay between researcher and the evidence (Strauss & Corbin, 1998). This process therefore forms the bedrock of the research outcomes, and requires careful consideration before embarking on any particular approach. In this study the strategies regarding how to analyse the evidence were informed by the following considerations:

- The evidence consisted mainly of textual data.
- The analysis strategy needed to facilitate the development of a theory.

Following on the above, I initially identified the following strategies that would be suitable for data analysis, viz., content analysis, discourse analysis and grounded theory method (GTM). After careful consideration

of previously completed research in IS theory development over the last decade,[11] I found that the GTM was a widely adopted method. However, after an initial stage of evidence collection, and analysis thereof, I identified a number of problems with the traditional GTM.[12]

4.5.1 Grounded Theory Method (GTM)

GTM can be described as an inductive, theory-discovering methodology that allows the researcher to develop a theoretical account of the general features of a topic while simultaneously grounding the account in empirical observations (Martin & Turner, 1986:141). According to Denzin (1994:508), the GTM is the most widely used qualitative interpretive framework in the social sciences. The GTM has dual roots, one in symbolic interactionism in the person of Strauss, and the other in the statistically-oriented positivism that was part of Glaser's intellectual repertoire (Alvesson & Sköldberg, 2000:12). Strauss and Corbin (1998:12) describe grounded theory as

> *"...theory that was derived from data, systematically gathered and analysed through the research process. In this method, data collection, analysis, and eventual theory stand in close relationship to one another. A researcher does not begin a project with a preconceived theory in mind. Rather, the researcher begins with an area of study and allows the theory to emerge from the data ... Grounded theories, because they are drawn from the data, are likely to offer insight, enhance understanding, and provide a meaningful guide to action".*

Tesch (1990:78) proposes that GTM is an appropriate technique for analysis when the following qualitative research interests exist: *"the characteristics of language; the discovery of regularities; the comprehension of meaning; and reflection".* She further explains that the

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[11] This was based firstly on my reading of the literature, and studies such as Berghout and Remenyi (2005) and Nasir (2005) that conducted analyses of trends in previous research.

[12] As advocated by Glaser and Strauss (1967) and Strauss and Corbin (1998).

discovery of regularities refers to the identification and categorisation of elements and the exploration of their connections (Tesch, 1990). This description aptly describes what this study aimed to achieve, i.e., to discover regularities (or common patterns) in the way success indicators of IS present themselves within e-Commerce businesses, and to identify and explore connections between these indicators with a view to deriving a theory. Travers (2001:42) points out the following important principle of the GTM:

> *"..an analyst should use a codified procedure for analysing data, which allows readers to understand how the analyst obtained his theory from the data".*

The grounded theory thus emerges through the process of concept discovery whereby the researcher moves from data to abstract concepts and categories. The processes of description, definition and specification of relationships achieve this. The resultant theory is attributed to the researcher's moving to a level of representation where the concepts form a theoretical framework (Huberman & Miles:1994).

Babbie and Mouton (2001:499) offer a rather insightful view of the GTM:

> *"Grounded theory holds as a basic tenet that qualitative researchers do not go around testing hypotheses to add to an already existing body of knowledge, but rather that they 'do not know what it is they do not know'."*

Given the foregoing definitions and descriptions, and keeping in mind the main tenets of the research design described in Chapter Three, the GTM appeared to be a relevant approach to use in this study. However, I found that the problems with GTM were not easily identifiable from broad descriptions of its purpose, such as those above. Rather the problems, which arose after I conducted a trial run, existed in two areas. The first concerned the specifics of the laborious techniques advocated by its original proponents, viz., Strauss and Corbin (1998). The second related to the principal point of departure that grounded theorists were supposed

to take. These problems were also identified by other researchers such as Bannister *et al.* (2006), who highlight that many researchers consider GTM to be excessively onerous, and Allan (2003), who also reports on the difficulties in applying GTM techniques.

4.5.2 Problems with the GTM (1): The conundrum of the tabula rasa & the role of reflexive interpretation & hermeneutics

One of the problems that Bannister *et al.* (2006:40) identify with the GTM, is the *"requirement that this approach to research should be without influence from what is already known about the subject"*. They go on to argue that this *"is not achievable and probably not even desirable"*. Denscombe (2003:127), in taking a similar view, advises that

> *"The need to approach things with an open mind is a fundamental principle of the grounded theory approach but, in practice, it raises some awkward questions. Researchers are inevitably influenced by prior conceptions based on their own culture and personal experience."*

In noting the above concerns, I realised that the principle of approaching the evidence with a neutral, unbiased view was not always feasible. This also conflicted with my epistemological stance on critical realism. I was also mindful of Alvesson and Sköldberg's (2000:36) conclusion to this problem:

> *"Grounded theory's striving for a totally unbiased approach thus means that pre-conceptions come in any way, but by the back door and in an unreflecting way, either in the shape of rationalistic assumptions or as adaptations to the actor's circumstances."*

Therefore my first point of departure from traditional GTM was to recognise that as a researcher I was an integral part of the social world being studied, and as such I could not remove myself from it. In keeping with the critical tradition, I acknowledged that a researcher has biases and hence is not neutral. Consequently, I chose to concede this potential bias rather than claim that my findings stem from a tabula rasa. Thus it

was more realistic to engage in reflexive interpretation[13] of the evidence, which makes a demand for reflection in research in conjunction with interpretation at several levels. This includes that of contact with empirical materials, awareness of the interpretive act, and the clarification of political-ideological contexts. Interpretation in this approach implies that

> *"there are no self-evident, simple or unambiguous rules or procedures, and that crucial ingredients are the researcher's judgement, intuition, and ability to see and point something out".*
>
> (Alvessön & Skoldberg, 2000:248)

The second point of departure to traditional GTM involved the use of hermeneutic principles to facilitate the interpretation of the data. In Chapter Three, I discussed the hermeneutic dimension of critical realism, and its role as an analytical tool for interpreting textual data. Thus in keeping with the critical realist underpinning of this study, as well as the requirements of reflexive interpretation, e.g., greater awareness of the interpretive act, hermeneutic principles were also used to facilitate the interpretation of the evidence. This involved constant reflection of each of the parts of the hermeneutic circle, i.e., the key-points[14] that I inductively identified in the evidence, in relation to the whole, i.e., ECIS success. As a result of frequent relating of the parts to the whole and vice versa, I was able to reflexively interpret the textual evidence, which eventually led to the findings of this study. This combination of hermeneutical and reflexive interpretation provided an acceptable scientific lever to apply to the evidence.

---

[13] As advocated by Alvessön and Skoldberg (2000:238-248).

[14] This refers to the key point identified during coding and is discussed in Section 4.5.3.

4.5.3 Problems with Grounded Theory Method (2): Microanalysis

Many practitioners of qualitative research have adopted criteria rooted in the positivistic paradigm to emphasise the validity of their methods and the various strategies they have developed to minimise bias and subjectivity (Pozzebon, 2003). This is exactly the problem that was identified with the GTM. The arduous nature of microanalysis, as proposed by Strauss and Corbin (1998), is unduly mechanistic. Furthermore, this approach resonates with the inflexibility of criteria used to argue for validity and objectivity, which are usually adopted within the positivist paradigm. This is in contrast to the qualitative approach of this study.

Strauss and Corbin (1998) recommend that microanalysis be conducted at the beginning of a study to generate initial categories along with their properties and dimensions. This entails a careful, often minute examination and interpretation of data (Strauss & Corbin, 1998:58). An example of using microanalysis is demonstrated by these researchers through a transcribed excerpt of a discussion between a group of university students and their teacher (Strauss & Corbin, 1998:61).

Field note quotation:
When I heard the diagnosis, it was scary. I panicked. Everything was doing well early in this pregnancy, and I felt good - no morning sickness, and I had a lot of energy. Then all of a sudden, I was told I had diabetes..."

Discussion and commentary:
Teacher: Let's focus on the first word, "**when.**" What could "**when**" mean?
Student: It represents time to me. A point in time. Some time indeterminately, in the past.
Teacher: Well, it could stand for some time in the future....

Figure 4.2: An excerpt of a transcribed discussion on how to conduct microanalysis using GTM
(Source: Strauss & Corbin,1998:61)

The discussion and commentary shown in Figure 4.2 is just a small excerpt of almost four pages of the transcript on the use of the word "*when*" by the interviewee. While this microscopic examination of

interviews may have value in some research projects, I found it that it was tedious and cumbersome for this project. Moreover, it was clear that microanalysis of just one transcript entailed an excessive amount of time. As the continued use of this approach would set back the project timeframes by many months, if not years, I needed to review the use of the technique. Additionally, I found that microanalysis led to confusion, as I was interrogating the evidence at an unnecessary level of detail in an attempt to interpret what the informant was saying in the interview. I also realised that by engaging in microanalysis, I was becoming distracted from the principal research questions of this project. Glaser (1992:40) is also critical of such an approach calling it "*over-conceptualisation*".

Thus after initially practising microanalysis, I decided that a better approach was to identify "key-points" that had some bearing on the main research questions. Allan (2003:2) describes key-point coding as identifying "*the points regarded as important to the investigation*". Although Strauss and Corbin stress the use of microanalysis as described above, they do however suggest that "*the analyst also might code by analysing a whole sentence and paragraph*" (Strauss & Corbin, 1998:120). Key-point coding therefore was a more acceptable means of applying GTM in that it did not warrant a tedious microscopic examination of each and every word in the transcript.

4.5.4 An adapted approach to analysing the evidence

After taking into consideration the problems with the pure GTM, my approach to the analysis of the evidence was follows:

- Firstly, the interpretation of the evidence was through a combined process of reflection (Alvesson & Sköldberg, 2000) and the application of hermeneutical techniques (Klein & Myers, 1999).

- Secondly, I opted to code the data through the identification of "key-points" (Allan, 2003) as opposed to in-depth micro coding (Strauss & Corbin, 1998).

In summary, the use of reflection, hermeneutics, and adapted GTM, together with the influences of critical realism (CR), formed a cohesive tripartite approach to the analysis and interpretation of the evidence. This is represented in Figure 4.3.

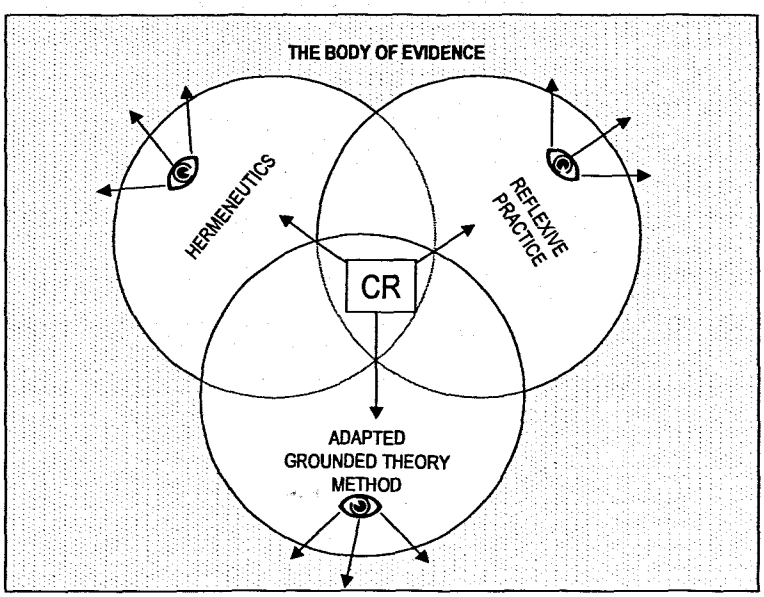

Figure 4.3: A tripartite approach to the analysis of the body of evidence

A high-level description of the procedure adopted was as follows:

- Transcribe interview and field notes and reflect on the contents of the transcript, using hermeneutical principles.
- Compare transcripts with field notes, pertinent information drawn from the business website, and any documentation provided by the informants. Note any inconsistencies that that are apparent.
- Replay tape and "cleanse" transcript, i.e., ensure accuracy of transcript as compared with the verbal interview.
- Further reflection of evidence.
- Conceptualise, i.e., conduct key-point coding.

4.6 Theory development: from concept creation to a higher-order narrative

Step two of the strategy that was adopted for theory development involved concept creation. According to Strauss and Corbin (1998:103), this is the first step in theory building. The act of conceptualising is referred to as coding. The purpose of coding is to

> *"build rather than test theory; to provide the researcher with analytical tools for handling masses of raw data; to help analysts to consider alternative meanings of phenomena; to be systematic and creative simultaneously; and to identify, develop, and relate the concepts that are the building blocks of theory".*
>
> Strauss and Corbin (1998:12-13)

The process of coding was undertaken using methods advocated by Strauss and Corbin (1998) in the main. This includes conceptualisation, categorisation of concepts, and axial coding. Reflection and hermeneutical interpretation are especially important in the process of coding.

4.6.1 Conceptualising

Conceptualising is an abstract representation of an event, object, or action/interaction that a researcher identifies as being significant in the data. The purpose behind naming phenomena is to enable researchers to group similar events, happenings, and objects under a common heading or classification (Strauss & Corbin, 1998:103). In conceptualising, data is broken down into discrete incidents, ideas, events, and acts, with each of these being given an appropriate label. The label that the researcher selects for the objects may be determined by *"the imagery of meaning they evoke when examined comparatively and in context, or the name may be taken from the words of respondents themselves"* (Strauss & Corbin, 1998:105). Examples of concepts

identified from the key-points of the transcripts in this study included *site visibility, data quality, change management* and *risk assessment.*

4.6.2 Categorisation: grouping of concepts

After an initial set of concepts has been identified, the researcher selects those that can be grouped under a more abstract higher-order set, referred to as categories (Strauss & Corbin, 1998:113). Strauss and Corbin (1998) recommend that the name of a category should be the most logical descriptor of what is going on in the data and is dependent on the perspective of the analyst, the focus of the research, and the research context. For example, in this study, the concepts *software testing, systems quality, conversion rate* were grouped together into a category named *ECIS evaluation.* Table 4.3 presents an overview of the categories derived.

Table 4.3/...

Table 4. 3: Categories of concepts that were inductively derived from the evidence[15]

	CATEGORY
1	**KEY ECIS FUNCTIONS & FEATURES** Key features and functions of ECIS that were identified as being important, and in some cases mission-critical.
2	**ECIS EVALUATION** Approaches used to evaluate ECIS success.
3	**BUSINESS MANAGEMENT** Specific business management issues that were deemed to have an effect on ECIS success.
4	**ECIS DEVELOPMENT** Aspects related to the development of systems that were contributory to successful ECIS.
5	**BUSINESS & IS RELATIONSHIP** Issues pertaining to the relationships between the actors involved in the management of the e-Commerce business and ECIS that impacted on success.
6	**CUSTOMER-FOCUSED** Highlights the importance informants attached to being customer-focused
7	**MANAGEMENT OF ECIS** Aspects concerning the management of ECIS that were related to success.
8	**AGILITY & INNOVATIVENESS** Business and ECIS management practices that enabled flexibility and agility in maintaining systems, and in being responsive to the external business environment.
9	**COSTS OF ECIS** The costs of developing and maintaining ECIS were cited as being prohibitive to e-Commerce success.
10	**HIGH RELIANCE ON ECIS** Highlights how the e-Commerce business has an increased reliance on ECIS as compared to brick & mortar business.

4.6.3 Axial coding

The purpose of axial coding is to reassemble the concepts identified during open-coding (Strauss & Corbin, 1998:124). Thus the refinement of the evidence continues by coding along the axis of each category. In certain cases, sub-categories are identified. Categories are then related to their sub-categories to form more precise and complete explanations about phenomena. For example, the sub-categories that were coded along the axis of the "*Business & IS Relationship*" category were: *turnaround time, service-level agreements, differing perspectives, business taking responsibility,* and *importance of joint team.* Details of

[15] Note that each row in this table represents a high-level category. Within each category a number of concepts were coded along the axis of the category into sub-categories, details of which are presented in Chapter 5.

axial coding of the categories are made explicit in the discussion in Chapter Five.

4.6.4 Preparing the evidence for the Higher-order Narrative (HON)

Using a constant comparative method (Glaser & Strauss, 1967:105-115) categories are then linked with one another to identify the central themes relating to the research questions (refer to Figure 4.4). There were no rules that guided how the categories should be linked together. Rather the linking of categories was a result of reflection on the body of evidence. The resultant themes constituted the basis of the higher-order narrative.

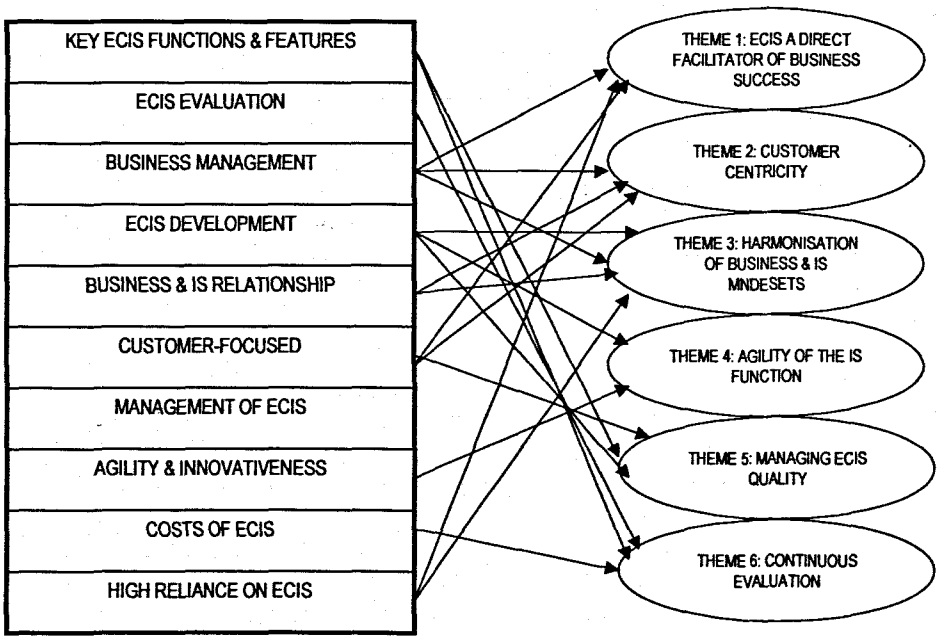

Figure 4.4: Interlinking of categories to form themes

4.6.5 From themes to theory

After careful reflection on, and introspection of each of the themes in the findings, I set out to identify a coherent set of relationships between the

principal concepts. This process of abstraction and juxtaposing of the themes resulted in the final theory, which is presented in Chapter Six.

Finally, it is important to note that, even though these analytical processes described above appear to be a linear process, in practice this is by no means the case. From the experience of applying the adapted GTM in this study, I found that I had to constantly move back and forth between each step, and between different sets of evidence. This was the only option for this methodology to succeed in grounding the resultant theory in the body of evidence. An overview of the entire analysis approach is depicted in Figure 4.5.

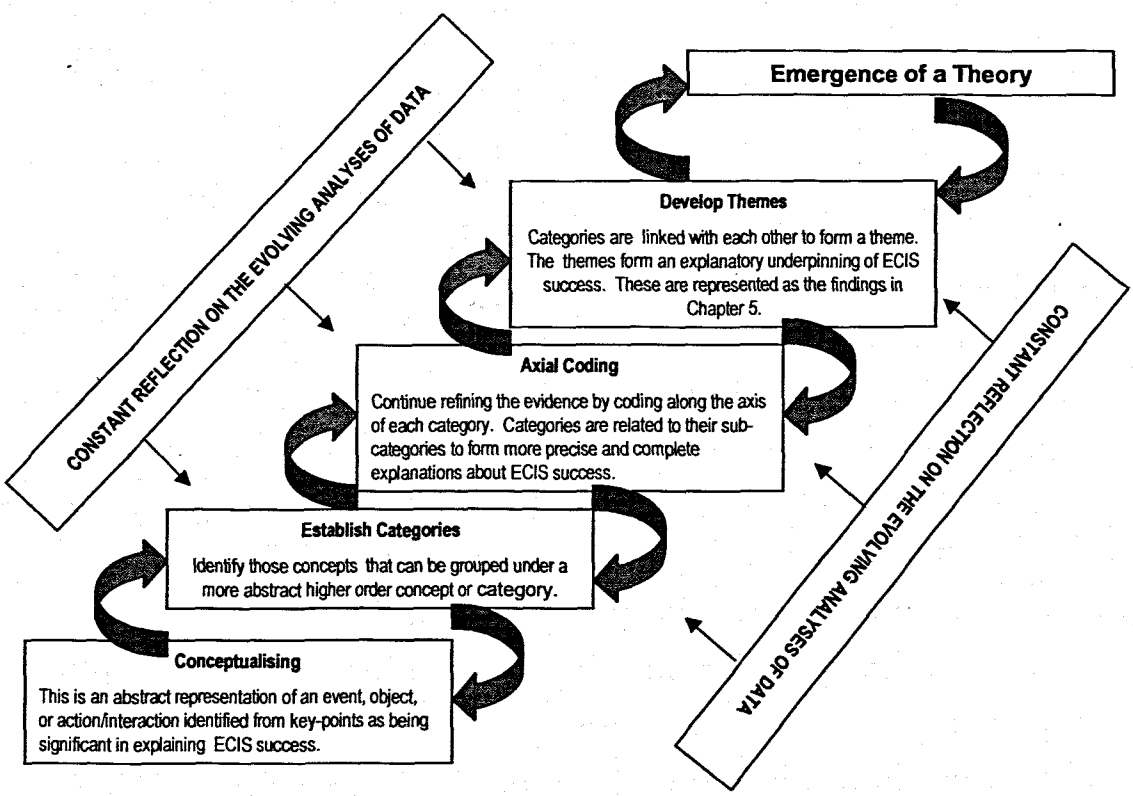

Figure 4.5: The iterative processes in analysing the evidence

4.7 Using a Computer-Aided Qualitative Data Analysis Software (CAQDAS) package to manage a large body of evidence

Each interview transcript yielded an average of approximately 7500 words.[16] After the first few interviews were transcribed and coded, using manual, i.e., pen and paper methods (see Appendix G for an example), I realised that the analysis would become cumbersome as the body of evidence expanded. Indeed at the end of the coding process, a total of approximately 850 pages of transcripts, comprising about 220 000 words of text, had been word-processed. In order to make the coding process more manageable, I consulted various texts on both qualitative research as well as the application of the GTM, e.g., Henning (2004), Strauss and Corbin (1998), Babbie and Mouton (2001). Based on the advice offered by these authors, I opted to use a CAQDAS tool to facilitate the analysis process.

4.7.1 What is CAQDAS?

The use of a CAQDAS should not be construed as having the same function as data analysis software such as SPSS that is often used in quantitative research paradigms. Most CAQDAS packages are currently designed not to undertake the analysis for the researcher, but rather to *facilitate* the process. A strong feature of CAQDAS is its ability to increase the rigour and manageability of qualitative data (Babbie & Mouton, 2001:503). A qualitative research project inevitably processes an extraordinarily large amount of unstructured textual data. As such, the management of this data poses a serious challenge to the researcher (Henning, 2004:129). Moreover, CAQDAS frees the researcher from the drudgery of using the manual methods of coding, comparing, and categorising. The researcher is thus free to focus on the acts of reflecting on the data, and identifying and relating concepts pertinent to the study.

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[16] Appendix H provides an excerpt of a transcribed interview.

After some investigation and consultation of a number of websites and texts such as Weitzman and Miles (1995), I opted to use the QSR NVivo (Version 2) CAQDAS package. The following extracts from the software user guide provide a synopsis of the capabilities of this software:

> *"NVivo provides a range of tools for handling rich data records and information about them, for browsing and enriching text, coding it visually or at categories, annotating and gaining access to data records accurately and swiftly...*
>
> *NVivo has tools for recording and linking ideas in many ways, and for searching and exploring patterns of data and ideas. It offers ways of connecting the parts of a project. As you link, code, shape and model data, the software helps you manage and synthesize your ideas, constructing and testing answers to research questions...*
>
> *The software helps you to manage and synthesize your ideas, providing a range of tools for clarifying understanding of the data and for arriving at answers to research questions".*
>
> (QSR International, 2002)

4.7.2 Using NVivo to conduct analysis/...

4.7.2 Using NVivo to conduct analysis

In applying my chosen theory development strategy, key points were inductively identified by *"trawling"* (Remenyi *et al.*, 1998) the higher-order narrative in the early stages of analysis. These key-points (refer to Figure 4.6) were coded into "free Nodes" in NVivo (refer to Figure 4.7) and formed an initial set of concepts, which would be organised into categories later.

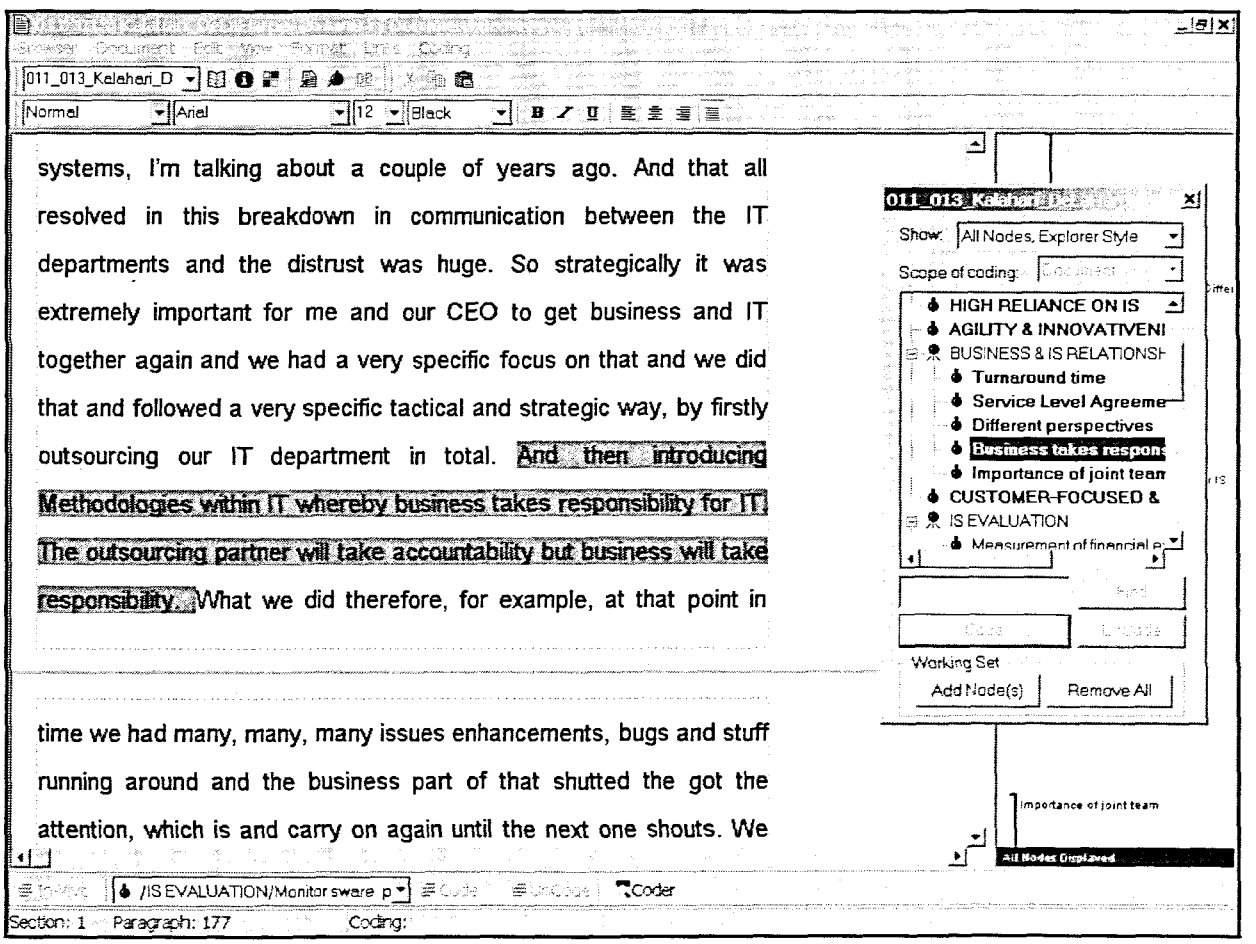

Figure 4.6: Key-point coding in Nvivo

Figure 4.7/...

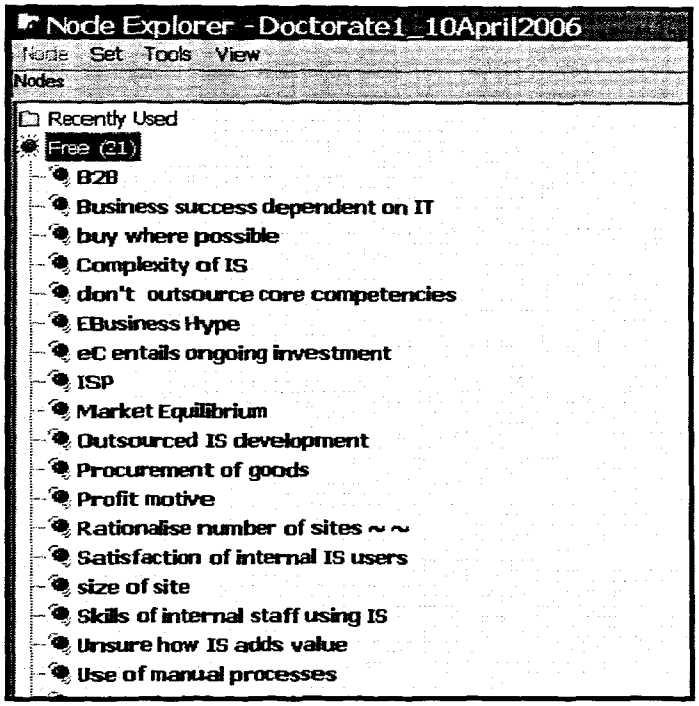

Figure 4.7: Coding using free nodes in NVivo

As further interviews were conducted, transcribed and analysed, the coding process began to yield further concepts that related to one another. This led to a reorganisation of codes into tree structures (refer to Figure 4.8) with the idea that each tree contained a group of conceptually linked items.

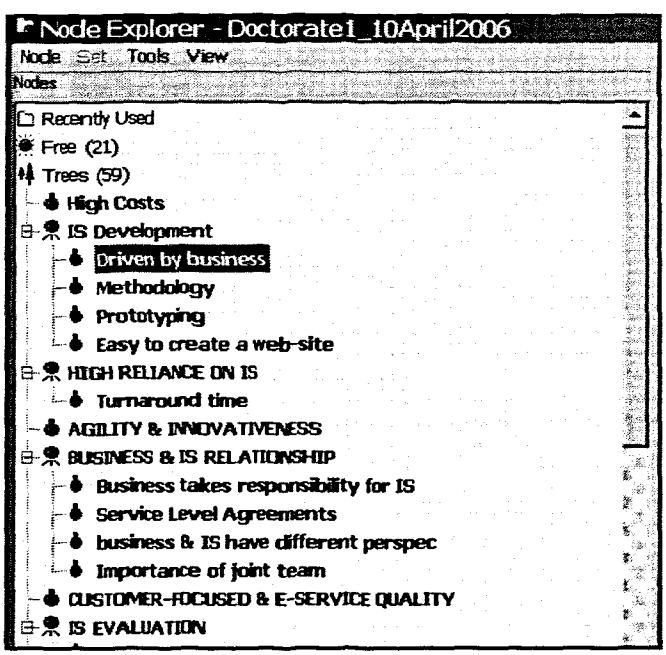

Figure 4.8: Categorisation using tree nodes in NVivo

Throughout the analysis process, it was also important to annotate certain parts of the transcripts. Strauss and Corbin (1998) refer to this as memos. The purpose of memos is to allow the researcher to note why he arrived at a particular interpretation. Memos are also useful when the researcher is not sure about the meaning of something, and would prefer to return to this later. NVivo facilitates the use of memos by providing a feature called a "databite", shown in Figure 4.9.

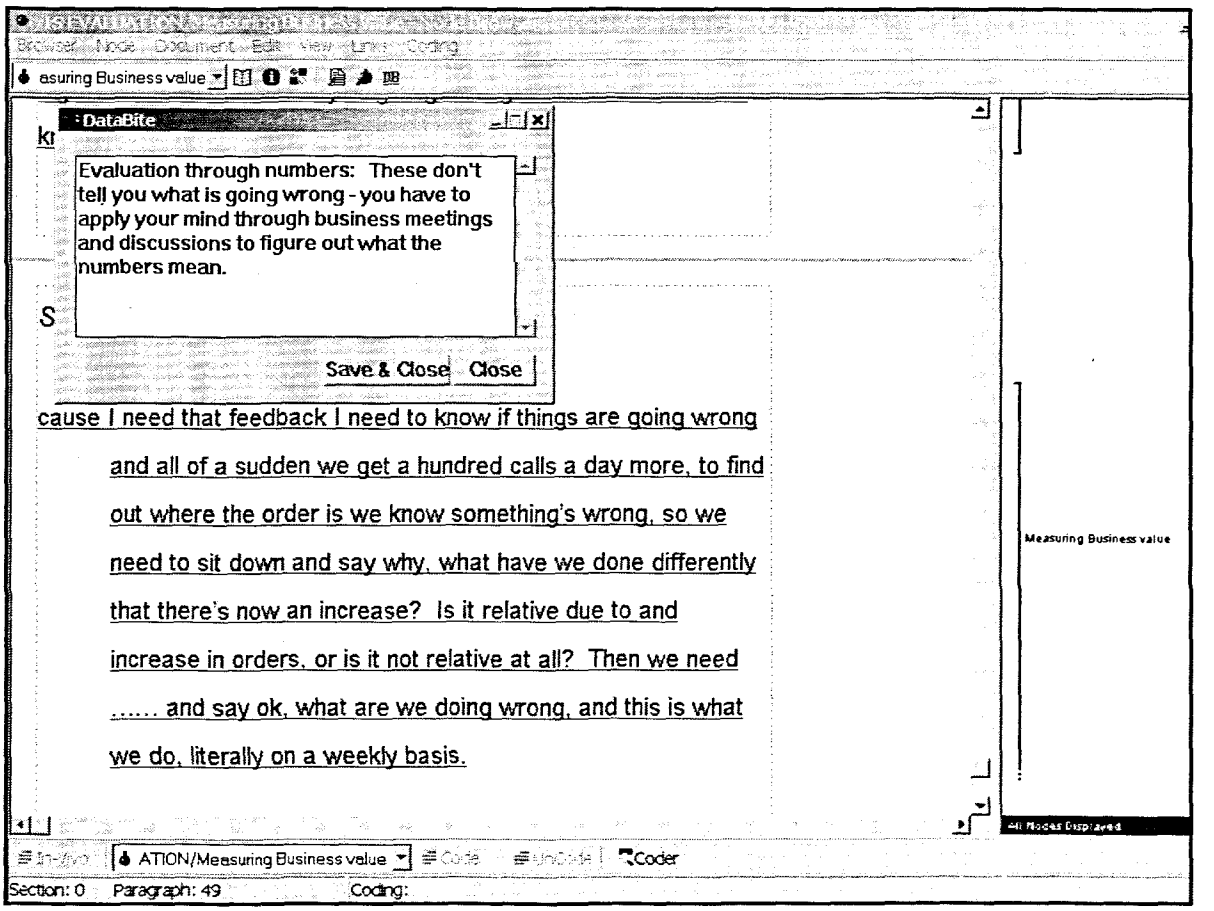

Figure 4.9: Using the "DataBite" feature of NVivo to annotate interview transcripts

4.7.3 Using the content analysis feature of NVivo to support interpretation of the evidence

Remenyi *et al.* (1998:130) offer the following advice regarding the development of a narrative:

> *"It is interesting to note that some individuals have much greater skill at narrative thinking than others and it is perhaps this skill which attracts them to qualitative rather than quantitative research. For others, narrative thinking on its own may be too difficult or there may not be sufficient structure to allow them to proceed with confidence. Various quantitative techniques, such as content analysis (Berelson, 1952) and correspondence analysis may therefore be used to help develop a higher-order narrative...".*

In the light of this advice, I subjected the evidence to content analysis as a means of supporting my interpretations of the data. Furthermore, as a critical realist, I was not completely averse to the use of quantitative analysis. NVivo has a useful content analysis feature. This was utilised to produce the results shown in Table 4.4.

Table 4.4: Results of content analysis

	CATEGORY	COUNT	%	Accum. %
1	KEY IS FUNCTIONS OR CHARACTERISTICS	285	21	21
2	IS EVALUATION	244	18	40
3	BUSINESS MANAGEMENT	244	18	58
4	IS DEVELOPMENT	163	12	70
5	BUSINESS & IS RELATIONSHIP	125	9	80
6	CUSTOMER-FOCUSED & E-SERVICE QUALITY	114	9	88
7	IS MANAGEMENT	56	4	93
8	AGILITY & INNOVATIVENESS	48	4	96
9	HIGH COSTS	37	3	99
10	HIGH RELIANCE ON IS	14	1	100
	TOTAL COUNT	**1330**		

The content analysis, in part, facilitated the development of the HON. It is important at this point to emphasise that the quantitative yield of each category was not the primary basis on which the findings of the study were derived.[17] Rather the content analysis provided an alternative avenue to interrogate the findings that I had inductively derived from the evidence through the application of the tri-partite analytical techniques (Figure 4.3) and through the process of coding, categorising and thematic linking. The central role of content analysis was to offer a comparative basis regarding the frequency of concepts in the evidence. In constructing the HON I had to reflect not only on the high-frequency concepts, but also on the low-frequency ones. By probing the evidence I had to ask questions regarding why there were low and high counts of certain concepts. This in turn aided the development of the narrative. The content analysis outputs from NVivo are presented in Appendix I.

4.8 An overview of the phases of the research

The journey through this research project was essentially one of discovery. At various junctures I assessed progress and discussed these with my doctoral supervisor and other research experts. Based on these assessments, I had to take decisions on how to proceed. These decisions were driven in part by the research design, as well as by experience gained as the study progressed. Table 4.4 presents a high-level view of the three phases of the research.

Table 4.4/...

---

[17] For example the category "*customer-focused and service quality*" in itself does not equate to the theme "*Customer Centricity*". This category together with the categories "*ECIS evaluation*", "*business management*", "*business and IS relationship*", "*management of ECIS*", and "*agility & innovativeness*" jointly contributed to the development of the "*Customer Centricity*" theme (Refer to Figure 5.1 in Chapter 5).

a detailed reporting of the findings, in the form of a higher-order narrative in the next chapter.

CHAPTER FIVE

RESEARCH FINDINGS: TOWARDS AN ECIS SUCCESS THEORY

There is no such thing as unmediated data or facts; these are always the results of interpretation.

(Alvesson & Sköldberg, 2000)

Overview

Since my first encounter with knowledgeable informants, answers to the questions concerning ECIS success have been developing. As the number of interviews increased, my understanding of the issues involved continued to evolve and mature. The findings presented in this chapter are representative of this evolving enquiry in my quest to develop an ECIS Success Theory. These findings advance the development of theory to its next stage. Through further reflection, and the inter-linking of categories that were derived through analysis, six themes emerged. These themes form the basis of the higher-order narrative, which is presented in this chapter. This narrative, being the penultimate step in the development of theory, articulates a detailed response to the principal research questions of this study. It is based on the collective body of evidence and provides both a rich and detailed insider-view of how ECIS is deployed and managed within the South African e-Commerce businesses that were studied.

5.1 Introduction

This chapter advances the development of the ECIS Success Theory to the next logical step, i.e., the presentation of a higher-order narrative. Using Remenyi and co-authors' definition of a higher-order narrative (Remenyi *et al.* 1998:126) as a point of departure, it can be described thus:

> *A higher order narrative captures the salient aspects of the information represented in the primary narrative. It also presents sufficient detail of each of the findings, which were inductively derived during analysis. The level of detail is*

> *demonstrative that the findings are grounded in the evidence. The higher order narrative provides a foundation for further reflection on the evidence, and the consequent derivation of theory.*

The higher-order narrative was developed through reflection and hermeneutical interpretation of the concepts and their associated categories. By interlinking the categories, six themes were derived (refer to Figure 5.1). These themes, in forming the basis of the research findings, represent my insight and interpretation of the evidence and how they relate to the questions concerning ECIS success.

FINDINGs -> CATEGORIES ⇩	FINDING 1 CUSTOMER CENTRICITY	FINDING 2 HARMONISATION OF BUSINESS & IS MINDSETS	FINDING 3 AGILITY OF THE IS FUNCTION	FINDING 4 MANAGING ECIS QUALITY	FINDING 5 CONTINUOUS EVALUATION	FINDING 6 ECIS: DIRECT FACILITATOR OF BUSINESS SUCCESS
ECIS FUNCTIONALITY				✓	✓	
ECIS EVALUATION	✓				✓	
BUSINESS MANAGEMENT	✓	✓				✓
ECIS DEVELOPMENT		✓	✓	✓		
BUSINESS & IS RELATIONSHIP	✓	✓				
CUSTOMER-FOCUSED & SERVICE QUALITY	✓			✓		✓
MANAGEMENT OF ECIS	✓		✓	✓		
AGILITY & INNOVATIVENESS	✓		✓	✓		
COSTS OF ECIS						✓
HIGH RELIANCE ON ECIS		✓				✓

Figure 5.1: Relationships between categorised concepts and the findings
(Shaded cells indicate the principal category underpinning the finding)

The narrative presented in this chapter, articulates a detailed response to the principal research questions of this study. It is based on the collective body of evidence and provides both a rich and detailed insider-view of the e-Commerce businesses that were studied. The higher-order narrative is particularly enriched by extensive references to detailed explanations from the body of evidence.

5.2 A generic ECIS configuration

The various components of ECIS infrastructure that are referred to in the narrative that follows, warrant some clarification. Figure 5.2 represents a generic configuration of ECIS infrastructure.

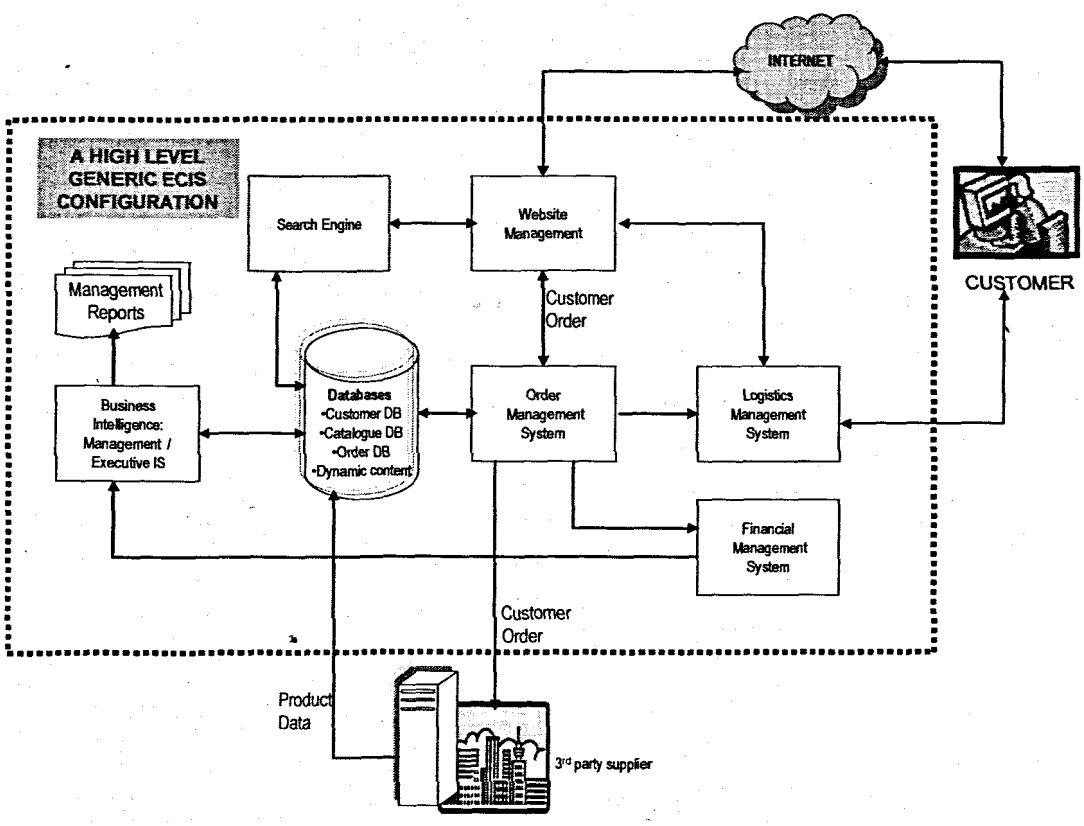

Figure 5.2: A generic configuration of ECIS infrastructure

This is a conceptual diagram and does not indicate hardware elements such as servers and networking infrastructure. Rather, this configuration

is the result of my interpretation of how the businesses that were involved in this study combined various ECIS in their e-Commerce operations. The various arrows represent high-level information flows. Not all the components depicted in this diagram may be necessary for all e-Commerce businesses, e.g., certain businesses did not use a logistics management system.[1] Similarly there were some businesses that included additional systems in their configuration, e.g., an IS fault-reporting system.[2] As a high-level configuration, systems such as payments systems, shopping carts, as well as detailed information flows, are omitted. Appendix K presents a more detailed description of each of the components in Figure 5.2.

5.3 Finding One /...

[1] Some of the businesses that were studied, especially those with smaller volumes of sales, used manual processes to organise the picking, packaging and shipping of goods.

[2] Businesses that had adequate financial resources were able to extend their ECIS infrastructure to include systems such as *Conlog* to manage IS fault reporting.

5.3 FINDING ONE: Customer-Centricity

Customer-Centricity (CC) is not simply a result of how well designed the web-interface is. Rather CC is deeply embedded in the design of all components of ECIS. CC involves developing systems that consider both the direct and indirect impact they have on the level of service experienced by the customer. Whereas the current literature discusses e-Service quality from a purely marketing perspective, focusing on customers' perceptions of website functionality, successful e-Commerce businesses understand that the so-called back office systems such as the DBMS, order processing, and management reporting systems are just as crucial in satisfying customers' expectations, and are therefore also a CC issue.

5.3.1 Introduction to Finding One

The following two excerpts from the interview transcripts, demonstrate that e-Commerce managers were of the view that online customers have higher expectations, and are generally difficult to satisfy:

> *"...the demand on speed in the Internet environment is really huge, much higher than in brick and mortar* [business]. *What I mean by speed is that when walk you into a shop and there's no toothpaste you don't mind – You just say, 'I'll get it next time'. If you go to the Internet shop and there is no toothpaste, the business gets e-mails and complaints like you can't believe. So the demand of the customer is much higher than in the brick and mortar" (De Goede , 2004).*

> *"...because ultimately with online shopping it is the service, you know, it's so much different ...When you do conventional shopping* [in brick & mortar stores], *and something is out of stock you can pick an alternative. Now with online shopping if you, as a customer don't get what you order... you're* [meaning the business] *in hot water" (Rutter, 2005).*

Terms such as "*customer service*", "*customer experience*" and "*customer satisfaction*" were cited frequently in the transcripts, e.g., Harris (2005), Wannenburg (2005), Meyer (2005) and on businesses' websites. The higher expectations of the online customer, and their low tolerance of

poor service, require that e-Commerce businesses be managed with a customer-centric ethos. Thus, the ECIS as an important facilitator of e-Commerce have a key role in supporting CC. This finding therefore is concerned with the elevated need in e-Commerce businesses[3] for ECIS to be designed, deployed and managed within a customer-centric mindset, as portrayed by the following interview excerpt:

> ***SP: "Why do you view your IS to be a success in this business?"*** [4]
>
> ***RB:*** *"IT is an enabler – it enables our customers to interact with us in a way that is easier for them. And therefore it is important to know if our customers are able to get through the process and afterwards have a warm, fuzzy feeling that: 'Hey that was pretty cool, painless and easy to do'." (Bothma, 2005).*

There were two dominant perspectives that underpinned the CC theme. Firstly, most informants tended to respond to the question concerning e-Commerce success by referring to the importance of their customers. Concepts related to CC and service quality were closely aligned to business success. The following excerpts, which are examples of responses from informants who regarded themselves as being successful, bear this out:

> ***SP: "OK, you said this definitely is a successful, business. What do you mean?"***
>
> *CA: "I think here we've got a lot of established customers who are happy clients. They order from us, some of them order from us on a daily basis. You know you don't get too many people that do the online scenario. And it's just, that they're happy, because we know them by their first names and they know us by our first names, and that's the kind of relationship we want to have with our customers. So when I say successful it is in that respect" (Azeem, 2005).*

> ***SP: "You say that the way your business operates is unique? Have you differentiated yourselves in any way that makes you more successful?"***
>
> *WM: "Ja* **[sic]**. *We are successful because we got the big slogan here. That slogan is TCE (Total Customer Experience). For us to be a world-class business, we've got to make sure every single dealing that a customer has with the business is world class whether it's placing an order, surfing the website, receiving an order, the way it's packaged. He needs to have a total customer experience with us and that customer experience needs to be consistent throughout" (Meyer, 2005).*

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[3] As compared with brick and mortar businesses.

[4] Note that in cases where the interview excerpt contains a conversation between interviewer and informant , the initials "SP" refer to the voice of the interviewer, i.e., Shaun Pather. The interviewee's "voice" is indicated by his initials, e.g., "RB" in this instance. The source of the excerpts is indicated by the reference at the end of the quote. This convention is adhered to throughout this chapter.

Secondly, concepts that were attributed to customer-centric ECIS emerged after reflecting on aspects of the interviews in which business processes were discussed. A large number of informants discussed the success of ECIS by alluding to the customer. Informants were particularly concerned with the impact of back-end ECIS processes on the customer. The ambit of the discussions extended beyond the web-interface and included several issues relating to the development and deployment of back-end ECIS.

5.3.2 ECIS development

ECIS that are regarded as customer-centric would require that both internal business users as well as external users, viz., customers, are incorporated as important stakeholders during systems development. The role of both internal and external users is especially important during systems planning and analysis phases, as well as during systems design (e.g., prototyping) and implementation (e.g., user acceptance testing). When this theme first emerged, I probed the evidence in more depth to establish the extent to which informants were attentive to CC imperatives. The content analysis suggested that IS managers did not make as many direct references to CC as compared with business managers. This implies that the IS stakeholders were not attuned to CC as their business counterparts. Of the 22 interviews with IS stakeholders, evidence in only two instances stressed the importance of CC during ECIS planning and development. The following excerpt illustrates the problem faced by IS teams in this regard:

> *"Satisfaction of the user is a key component to our development – but it is difficult when the client base is very broad, and especially when there is no analysis done of the target market... they've* [referring to their e-Commerce client] *got a team with different business stakeholders such as marketing, management etc., and everybody has got a slightly different idea of what end-users' needs are" (Ormandy, 2003).*

On the other hand, there were several examples which demonstrated that business managers were alert to the requirement of CC during ECIS development:

> *"So it's not us going along and saying* [to the IT department] *that we're going to do this without asking the customer, the customer has to be consulted because if they're not, they are not going to be the ones buying into it" (Cruywagen, 2004).*

> *"That's where we've been very successful in that we've used the customers' perceptions of the website to put together a really efficient booking – its all about the customer" (Van der Merwe, 2004).*

> *"So we just tried to build a facility where the up-sell technology is extended. So when you order flowers you now get a range of products that are on sale and it will be delivered with your flowers. Now how can we do that? If we can't build the technology that the customers require, we're losing revenue" (Bothma, 2005).*

The foregoing is indicative of a mismatch between views of IS and business stakeholders, and is a cause of concern. The implementation of strategies to foster a closer alignment between these stakeholders is one approach that could resolve this. This is discussed further in Finding Two.

5.3.3 *The Database Management System (DBMS)*

The DBMS was identified as the system that had the most impact on customers, when compared with other back-end systems. Therefore, e-Commerce businesses that designed the database with CC in mind were in a better position to service the high expectations of their clients.

In the following examples, informants described how they responded to customer queries by profiling customers based on their prior purchasing histories:

> *"If I have a query from a client, I need to know: Is this guy new? Has he bought from us before? What wine does he drink (red or white)? What sort of price range does he buy and so on? Does this customer buy on rating, or does he buy on price? You know I need all types of information down to almost what his dog is called!! So I need that information before I go back to the guy. And so it makes a huge impact on someone when they get a response that exceeds his expectations, because you found out more about him, than he told you in that particular email.*

> *So when we get a query, we know if a guy has ever bought from us before, and we know what his preferences are. So he might have just sent a general enquiry say enquiring about auction prices and we get back to him with very specific information geared to his needs as determined by his historical data with us. Now this blows a customer's mind away as opposed to getting an automated email" (Paulse, 2004).*

> *We designed the database so that it produces the information we need to understand our customers – so then we are in tune with their needs and we are able to service them more effectively. So the database structure was informed by this need to have a customer profile accessible so that the moment we had a query we knew his profile, and could give him service tailored towards his profile (Hammond, 2004).*

The examples above show how CC could be promoted by forethought during the planning of the logical design or database schema. When data structures are ill-conceived, the business could be hampered in their quest to be customer-centric.

A second DBMS-related problem that was common, concerned the quality of data, sourced from third parties. This was a particular challenge as many of the businesses alluded to the incompatibility of product data from third-party suppliers. The uploading of data was fraught with problems, and as a result customers were provided with incorrect information on the website. Furthermore, erroneous data resulted in delayed deliveries owing to the non-availability of the stock item, or worse still, cancellations of purchases. The manager of an online digital accessory store underscored the importance of accurate data related to CC:

> *"...when you're online you don't have the options to touch and feel what you're looking to buy. We therefore have to make sure that the consumer confidence is high when it comes to deciding what to buy from us with what we offer. So if we put up a product, e.g., a digital camera – people love to play with digital cameras – they want to know the size, they want to know the weight, they want to know the colour. So we've got to make sure the picture we put up there came out absolutely correct. So we source that picture direct from the manufacturer by product code because that product is unique, and then the same with information, we've got to make sure that all the information is correct and accurate... ." (Meyer, 2005).*

Thus the quality of the data has ramifications on customers' perceptions of service. For example, a customer who receives an item that isn't

100% the same as the description on the website, or is told that the item he ordered is not in stock, or can only be delivered in twenty days instead of the promised five days, is likely to form a negative perception of service quality. It is thus probable that that customer will choose to do business elsewhere, and therefore rampant problems of this nature will result eventually in a poor image of service, and consequently a decline in sales.

5.3.4 Fulfilment

The ECIS that support order-fulfilment were also found to be an important CC issue. In particular the interface between the e-Commerce business's order processing systems, and those of their delivery agents, affected the organisation's ability to service their customers. A well-designed system would ensure that relevant data such as order details and the delivery address are accurate. The next hurdle is for this data to be both timeously and accurately conveyed to the delivery agent's system. As the following interview excerpt demonstrates, simple errors could have potentially devastating effects on customer service:

> *"...the KMS* [referring to their custom-built order processing system] *is also utilised as the delivery mechanism. This feeds data into the distribution centre where they will do the picking and packing and delivery. Again 100%, no margin for error! If you pick* [product items] *wrongly* [**sic**] *we've got a problem: the customer won't get what she ordered and that can be quite dramatic. Although the values may be small you can imagine it can easily happen you can send an adult movie to a person who for instance is a priest!" (De Goede , 2004).*

5.3.5 Management reports

There are various types of standardised management reports that are equally important to an e-Commerce business as compared with any other brick and mortar business, e.g., sales reports, invoice summaries, supplier reports, etc. However, many managers that were interviewed stressed that they needed more than standardised reports. One informant, for example, alluded to the fact that they had access to lots of

information, but this was not useful as it only provided a *"one dimensional"* view (Meyer, 2005).

There are certain e-Commerce business functions in which reports become a critical success issue. Managers are seeking ways in which ECIS can provide them with "*business intelligence*" (De Goede, 2004; Harris, 2005)[5] that would support business decision-making insofar as one-to-one marketing is required.[6] A successful e-Commerce business takes into account the personalised interaction expected by customers. E-Commerce managers are therefore expected to be cognisant of this. The implementation of systems that provide management reports,[7] are therefore important in supporting CC. The following example illustrates this:

> *"...and the one thing that we are not doing effectively is classical one-to-one marketing. In this approach the customers expect you to learn every interaction that you have with them. It should be a learning experience for us as a organisation and they* [the customer] *want to see that reflected. But because we are looking at reports, and because we don't have really robust business intelligence, we are not truly learning each time we interact with a customer in a way that we can push a newsletter out that is more targeted to that person..." (Harris, 2005).*

The reliance on ECIS to provide *business intelligence* therefore underscores the importance of both management and executive IS in ensuring CC.

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[5] The term "business intelligence" was used by these informants to describe the outputs of management reports that support business decision-making.

[6] One-to-one marketing is an approach that concentrates on providing services or products to one customer at a time by identifying and then meeting their individual needs. The term was first introduced into the literature by Peppers *et al.* (1999) in *Harvard Business Review*, and was subsequently discussed more substantively by Godin (1999).

[7] Most modern DBMS have the functionality to provide such reports, by manipulating the data through programmed instructions. Online analytical processing (OLAP) tools are also another useful means to harvest customer data for management reports.

5.3.6 The website

The web-interface represents the main point of interaction between the e-Commerce business, their customers and the outside world. As such it has an important role in supporting CC. Website-related terms were frequently mentioned by informants. However, informants did not engage in detailed discussions around website design, preferring to deal with this issue in brief only. I reflected on the lack of depth of the discussions on this component of ECIS and concluded that the reason for this is that the website itself is a mature technology, and therefore was already well understood by the informants. Thus the brevity of discussions concerning the website did not imply that this ECIS component was unimportant to informants. The website concepts which were highlighted by informants most frequently, and which support the CC theme, were *ease-of-use* and *user-friendliness*, as indicated in the following excerpts:

> *"...there is also the user friendliness aspect. To get to any one wine, there is* **[sic]** *probably about six or seven routes to get there, because people don't think alike, people have different logic patterns, people come in with a different frame of reference... and therefore, I think the user-friendliness of the site is imperative" (Paulse, 2004).*

> *"I want to ensure that it is convenient to go and shop online. I make it extremely easy. I suggest that my service is what makes me different and the feedback that I've got is exactly that. You know people are very happy that it's really easy and convenient to shop on my website; they love the experience, and they enjoy it ..." (Wannenburg, 2005).*

Another important aspect of the website that was identified as being critical to CC was the search engine, as explained by the following informant:

> *"Okay, I think one critical area is that you have got to have a really top notch search engine. The search facility has got to be one of your major drivers ... if that's running slickly and if you doing best of breed – then you're in the pound seat. When you're dealing with over a million products – the customer has to easily find what he or she is looking for in the shortest possible time ... or else you will frustrate him" (Harris, 2005).*

Lastly, the other aspects of the website that informants attributed to CC, included information quality, branding, trust and speed.

5.3.7 Summary of Finding One

Figure 5.3 is a representation of the generic ECIS configuration presented in Section 5.2 above. The symbols 1 through to 6 in the diagram are used to highlight six critical areas of ECIS that impact on CC. (Note that the discussion that follows, uses the same symbols to reference the diagram.)

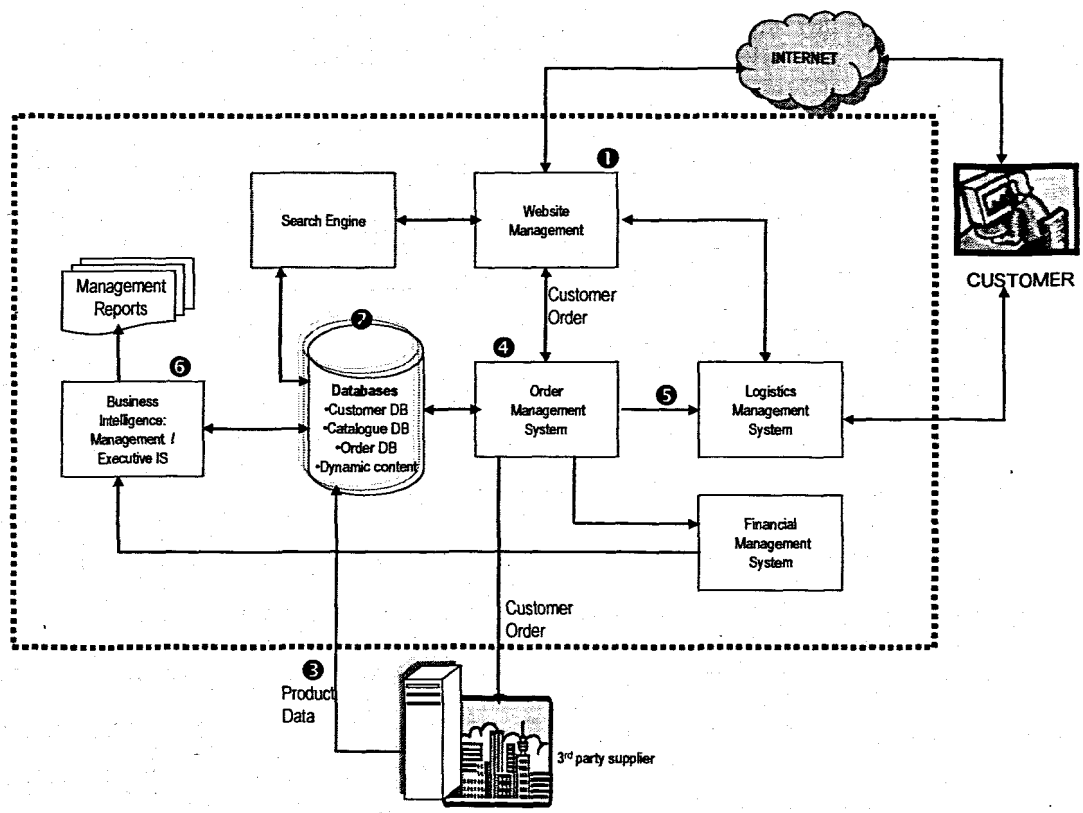

Figure 5.3: Critical areas of ECIS (numbered 1 to 6) that impact on CC

❶ The web-interface is the customer's first point of contact with the business and as such it will have the most impact on CC. This is well recognised in the current literature, with substantive research having been conducted into website design, usability of websites, and electronic service quality. However this study has found that CC extends beyond

the website. Thus those aspects of the ECIS identified in points 2 to 5 below, are equally important in ensuring CC.

❷ The database is a critical component of ECIS. Its centrality to other components of the ECIS infrastructure (such as Business Intelligence and Order Management Systems) implies that next to the website, its design warrants careful thought as to how CC can be facilitated.

❸ The interface between the e-Commerce business and third party suppliers is an important aspect of the ECIS infrastructure that has a bearing on CC. The ability of the business to receive product data quickly and efficiently from its suppliers influences the accuracy and relevancy of catalogue data in the DBMS. This in turn impacts negatively on the customer who, for example, could receive inaccurate information regarding the availability of an item or even the specifications of an item being purchased.

❹ The order management system is responsible for receiving and processing the customer's order. If the order is not processed in a timeous manner, or if inaccurate details regarding the order are processed, then the business is ultimately faced with a dissatisfied customer.

❺ The logistics management system facilitates the final fulfilment of the order. If there are problems with the processing of information in the order-management system, deliveries are either delayed, or the wrong products could be delivered to the customer.

❻ The management reports produced by business intelligence systems enable managers to analyse the profile of customers, and to make decisions that that positively impact on the needs of customers, thus increasing loyalty and return sales. Based on information contained in

these reports, managers are able to make sound decisions regarding the effective deployment of IS resources, system enhancements, and the initiation of new IS projects.

In summary, this finding has focused the need for ECIS to be customer-centric in the way in which they are designed, deployed and managed. Customer-centric ECIS are therefore of critical importance to the success of the e-Commerce business. There are two important management issues that impact on the ability of the business to deliver this. These are the harmonisation of business and IS mindsets, and the agility with which ECIS are managed (refer to finding Two).

Finally, the importance of customer-centricity needs to be qualified. CC in general, is a key issue especially for businesses that are located in a market in which there is a high degree of competition. Those businesses that have clearly formulated strategies in place to ensure that they meet or exceed their customers' expectations are those who would usually capture sufficient market share to remain profitable.

In the e-Commerce domain, due to the pervasive nature of the web, CC has become even more important since customers who are dissatisfied are able switch to another online company more easily if they are dissatisfied.[8] Colby and Parasuraman, for example, argue strongly that those businesses "*who truly understand the desires and concerns of the growing base of e-customers will be the winners in this new era*" (Colby & Parasuraman, 2003:28). Thus the role of ECIS in facilitating the retention of customers is considerably more important than in brick and mortar businesses. There are however exceptions to this as it may be possible in certain instances for an e-Commerce business to have low levels of CC and yet still be profitable. For example if a business does

[8] In brick and mortar environments customers were constrained by geographical locations of the business.

not have any competitors, its customers' options are confined.[9] Thus even the most uncaring companies could succeed if there is a sufficient demand for their product or service. In such cases, customers who have a need for a certain product will transact online with the company regardless of their perceptions of how well ECIS are used to meet their expectations of quality service.

Finding Two/...

[9] In South Africa, the online wine retailer *Cybercellar* is one such example.

5.4 FINDING TWO: Harmonisation of business and IS mindsets

> *The e-Commerce environment requires a deeper intimacy between the IS function and business management. The traditional tensions normally experienced between these two groups need to be eliminated so as to foster a greater congruence of IS and business-thinking. This is referred to as the harmonisation of business and IS mindsets.*

5.4.1 Introduction to Finding Two

Finding One highlighted the importance of CC in the e-Commerce environment. This suggests that a new attitude on the part of business managers to IS, as well as that of IS managers to business, is required. The demands placed on ECIS to achieve CC imply that IS and business-thinking need to be harmonised in a more fundamental way than has been required in the brick and mortar environment. The term harmonisation as opposed to alignment,[10] more appropriately describes the relationship that is required to prevail between business and the IS function. This finding inspects the crucial issues pertaining to this relationship and how these impact on the success of ECIS. It examines how the congruence of IS and business-thinking strengthens the organisation's ability to successfully implement a customer-centric business model. Finding Two therefore builds directly on Finding One and leads to the conclusion that a deeper harmonisation of business and IS stakeholders is required in the e-Commerce environment.

Several of the themes identified during the analysis were adapted or changed, or regrouped, as the body of evidence grew larger. A category named *Business & IS relationship* was identified during the

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[10] The literature currently refers to the alignment of IT and business, e.g., Henderson & Venkatraman (1993); Luftman (2003); Coughlan *et al.* (2005).

early analysis phases. At the point of theoretical saturation, this was one of the categories that had not been renamed or changed. This is indicative of the importance of this theme to the research questions. One of the underlying motives behind this finding was the different perspective of ECIS that emanated from the two groups of informants, viz., business and IS stakeholders. The following two excerpts emphasise this:

> *"The other thing that I think from an IT perspective is that we are not technical people ... um ...*[sic] *we'll sit down and – well you know we are great at blowing up balloons and drawing pictures – that's what Marketing is all about. What we're not good at is that we don't understand what happens behind the scenes and sometimes maybe it's important that we do but that's not what we are employed to do. So it's critical for the IT people to understand that they're there as a support. So if something does go wrong, or something that we don't understand, then we're not just stupid dumb users! We're actually there to try to create a benefit for whoever that may be – whether it be for the staff or whether it be for our customers" (Cruywagen, 2004).*

> *"So we've learnt from experience that most technology people, most software developers, are not business people. Equally business people are not software people. So we can't say: ' Look we want a site that kind of sells flowers and does this and that, and just make it happen', because they're going build it in a way that might not be consistent with our business practice – so we have to be very, very specific" (Bothma, 2005).*

These two examples bring to the fore the divisions that exist between IS and business managers, and hence the underlying rationale for this finding. Table 5.1 presents a summary of the sub-categories that were coded along the axis of the *Business & IS relationship* category.

Table 5.1/...

Table 5.1: Business & IS relationship sub-categories

BUSINESS & IS RELATIONSHIP	Count	% in this category	% of Total Count
Importance of joint team: *Both IS and business stakeholders participate jointly in decision-making regarding operational and strategic issues.*	49	39%	4.0%
Business takes responsibility for IS: *Business managers assume responsibility for IS operations*	23	18%	2.0%
General: *Concepts attributed to business-IS relationship but not to any of the specific sub-categories.*	18	14%	1.0%
Service level agreements: *Formal agreements between business and the IS function regarding service levels.*	18	14%	1.0%
Different perspectives: *IS and business stakeholders have different views regarding the determinant of ECIS success.*	12	10%	1.0%
Turnaround time: *The time taken by the IS function to respond to system maintenance tasks.*	5	4%	3.0%
	125	**100%**	9.0%

5.4.2 The business's responsibility for ECIS

The evidence suggests that the successful implementation of customer-centric processes is achieved through a joint effort of both business and IS stakeholders. Moreover, there was evidence of success when business managers, rather than their IS counterparts, assumed overall responsibility for ECIS. The informants in the following excerpts emphasised the role of business managers:

> *"It's important for us that ownerships rest on the business, not on an independent external party nor the vendor* [of ECIS]. *They are there to provide a service and expertise, be it technical expertise, or process expertise, or change-management expertise, but they will never take ownership of a project and hence will never make decisions on behalf of the client. They will make recommendations on what is the best thing to do" (Mitchell, 2004).*

> *"My line responsibility is IT. Having said that, the mechanism that we have in place is still not one, where even though I really understand the business pretty intimately, I still don't as an IT person take responsibility for priorities. Priorities are determined 100% by the business side by the commercial team" (Schreider, 2004).*

However, contrary to the above, there were business managers who believed that the ECIS domain was not one in which they should interfere. Sometimes this was as a result of a feeling of inadequacy as they felt that they did not have the necessary skills. One informant described this situation as follows:

> *"And senior management usually won't have a good grasp of what is involved in e-Commerce systems and they quite often leave it to the IT guys – which is wrong. As you know this is not a thing* [e-Commerce] *we should to be seeing as an IT- driven initiative. IT plays a large part of it but the business itself has to drive it" (Marshall, 2004).*

It is important therefore, that an e-Commerce business manager has an understanding of ECIS, so that he is able to make meaningful and insightful decisions. Managers who have oriented themselves to ECIS will also benefit in that they would be able to interact with IS personnel from a more informed perspective, rather than one of ignorance. The following interview excerpt demonstrates a situation in which a manager had to rely on the IS function:

> ***CA**: ... but I'm personally not a developer so I can't comment on the code.*
>
> ***SP** : Do you think that's important in your job – to be able to comment on the code?*
>
> ***CA**: I don't think so, I look at it more from a business perspective you know, I leave the technical issues up to people who are qualified – because of the past relationship we have experienced – we don't have to question what's going on you know and obviously if there are any problems I'll just call in one of the guys from IT just to check that everything's fine and they'll just have a look at it and say it's ok. (Azeem, 2005).*

By quoting the above, it is not my intention to imply that e-Commerce managers need to be technically literate on all aspects of the ECIS such as the programming code. Rather, as a minimum, the manager is required to be conversant with at least the basics of the ECIS. Of all the businesses encountered in this study, those that claimed to be successful had managers who had a firm understanding of ECIS, and who were in a position to confidently engage with IS personnel. One informant who had broad experience in several e-Commerce projects,

highlighted the repercussions of delegating the responsibility to IS functionaries:

> *This* [referring to the e-Commerce business] *cannot just become an IT thing – if it does it will fail. Coz* [**sic**] *IT will only look at the technicalities that's involved and that's all they will worry about. They* [IT personnel] *won't worry about business issues, about the business processes that perhaps need to be modified or changed before they're implemented or they might not have certain processes in place. We put a lot of emphasis on trying to make the business understand that they have to acknowledge this and they have to be responsible for it (Marshall, 2004).*

5.4.3 Strategies for promoting harmony between business & IS teams

In organisations in which there was limited collaboration between business and IS stakeholders, each of these groupings viewed each other with some disdain. The two examples below demonstrate this. The first is a software developer's view, and the second, a business manager's:

> *"The problem depends on management style and leadership in the organisation. If a client is open-minded about his business and acknowledges his lack of Internet-related knowledge, and is willing to commit to working jointly with us – then we can achieve quite a lot. But we've often got clients that are convinced that actually they are the designers themselves even though they've got very little knowledge of the Internet. That is very often a problem. That is dangerous!!! Managers should understand how important the e-Business solution is to achieve financial gains – and if they don't they should rely on somebody else's input and accept it" (Ormandy, 2003).*

> *"Because the designers of the websites are often not involved enough in the actual business, they perceive what they think should be on the Web. And so they go and they spend a lot of time – which costs the company a lot of money – to put up things on the website that look good. Perhaps it works perfectly and does all the right things, but if you actually look deeper, you find that those pages are visited by very few people" (Niewoudt, 2004).*

The above is typical of situations in which there is minimal collaboration between the business and IS function. Even in instances where a business has outsourced its IS, it is incumbent on business management to create the means and opportunities to jointly tackle both the daily as well as the strategic challenges posed by the ECIS.

The best example of a successful relationship between the IS function and business stakeholders was that of the leading South African e-Tailer, *ShopperSA*.[11] When *ShopperSA* initially commenced operations in 1998, the relationship between business managers and the then embryonic IS department was at low ebb. In the initial period of their operations, the ECIS were plagued by serious problems such as bugs and inadequate performance. Because of the rush to be in business, the initial attitude of business managers was *"Get something going, get it on the Web"* (De Goede, 2004), without due consideration of the implications of their requests. This is clearly an unsatisfactory approach to any business project and perhaps especially an IS project. However, in this instance the IS function responded as best as it could by trying to implement these requests without fully understanding what was really required. This led to unsatisfactory systems, which in turn resulted in distrust between the two parties and eventually a substantial breakdown in communication. Thus, after an initially poor start to the business in which the website was actually shut down, the management made an all-out effort to reconstitute the way in which they approached their relationship with the IS function. In the words of the Chief Operations Officer:

> *"We then introduced methods of operations within IT whereby business takes responsibility for IT. The outsourcing IT partner will take accountability but business will take responsibility"*[12] *(De Goede, 2004).*

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[11] i. Note that names of businesses have been changed in terms of the confidentiality agreement with informants.

ii. Although IS-Business harmonisation concepts were also identified in the evidence collected from various other businesses, I have chosen to explain this finding through this particular business, since it best represented all of the concepts associated with *Business-IS harmonisation.*

[12] There are different views about the meaning of *accountability* and *responsibility*, and these terms could be used synonymously. Having reflected on this interview transcript, what this informant is implying is that the IS (or IT) partner will oversee IS operations, but eventual responsibility for the actions of the IS functionaries rests with the business manager.

ShopperSA successfully harmonised the business and the IS function using a three-pronged strategy:

- Firstly a weekly business-prioritising meeting was institutionalised. A task team of business stakeholders (see Figure 5.4) meets weekly with IS managers and does short- and medium-term prioritising. Criteria that guide prioritising of IS tasks are linked to business rules, e.g., tasks that directly affect keeping the business open are at the top of the list, followed by tasks that directly affect turnover and profit, followed by non-urgent system enhancements.

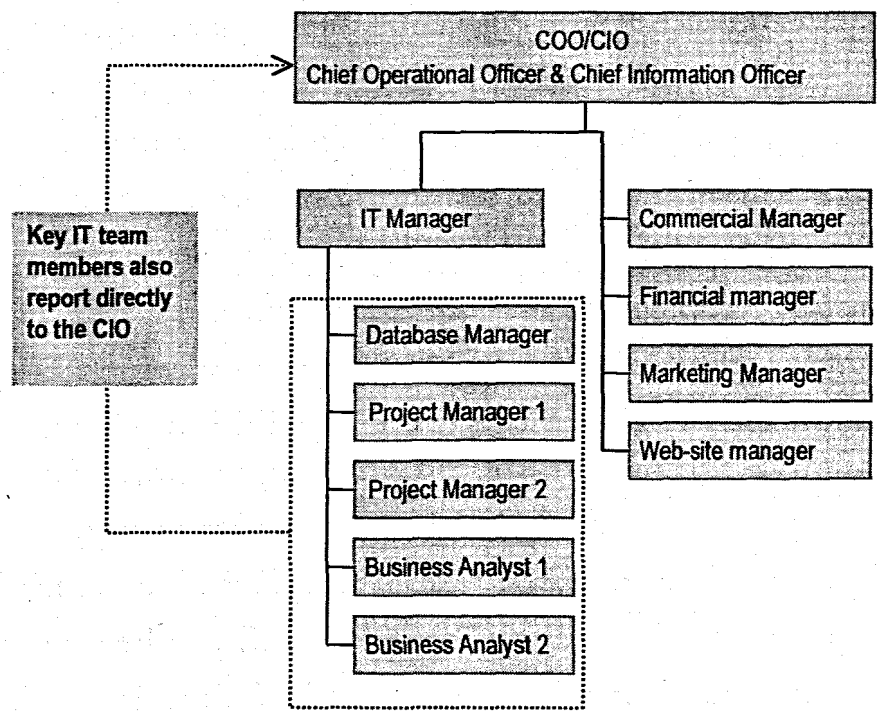

Figure 5.4: The ShopperSA joint team structure: an example of how restructuring could achieve harmonisation of business and the IS function

The result of these team meetings led to two benefits, the first of which led to smoother decision-making regarding prioritisation of IS tasks. Business stakeholders now understand the role and functions of the IS department across all sectors of the business, instead of from a narrow line-function focus in which they only had a view of their own section's needs. The result of this was that different

business managers developed a mutual understanding of each other's needs. It was therefore easier to reallocate resources when critically urgent tasks arose. The second benefit was that IS stakeholders began to understand what was in business managers' minds, and how they thought about business. This helped to remove the distrust that existed previously between the two parties, and IS personnel were able to perform their tasks from within a business context as opposed to an IS only contextualisation of task accomplishment.

- The second IS-Business harmonisation strategy adopted by *ShopperSA* involved the institutionalisation of more formal systems development methodologies called RUP.[13] The value of having a methodology in place was that it introduced formal processes that produced project documentation that was meaningful to both IS and business stakeholders. In this way all the role-players were able to participate in systems development phases with confidence. As a result of the implementation of this new methodology, business stakeholders became fully involved in all phases of the systems development life cycle.
- The third strategy involved getting key IS team members involved in decision-making at all levels. As a result, IS stakeholders were involved in making decisions from the moment a new project was mooted by a business manager. Furthermore, they were also involved in routine business meetings at which issues such as gross profit, budgets, turnover, etc., were discussed.

5.4.4 Summary of Finding Two

In the e-Commerce environment it is incumbent on the business management to take responsibility for the management of ECIS as opposed to devolving this responsibility in total to the IS function. The

management of ECIS should be viewed as a business responsibility and not that of the IS function, whether it is based in-house or outsourced. This implies that e-Commerce business managers are required to influence and direct the IS function through a joint discourse which should take place within a participative decision-making structure. Thus successful ECIS is driven jointly by both business and IS stakeholders through carefully structured team meetings. IS managers also need to be included in business decision-making. In a joint decision-making environment the management of ECIS is driven by a collective mindset, which simultaneously takes into account business priorities as well as ECIS challenges. Lastly, harmonisation can be achieved by ensuring that business and IS stakeholders are involved in all phases of the IS life cycle.

Finding Three /...

[13] RUP® is a comprehensive, web-enabled set of software engineering best practices that provide guidance for streamlining the team's activities (Kroll, 2001).

5.5 FINDING THREE: Agility of the IS function

The constantly evolving environment in which e-Commerce businesses exist requires a special degree of agility from the business and the IS function. Systems and processes that are rigid do not allow the organisation to easily adapt to this dynamic environment, therefore constraining the business's ability to maintain a competitive edge. Agility requires innovative IS management practices to ensure the continuous ability of ECIS to support customer-centricity. Agility is therefore an important strategy that enables the business to be responsive to its customers' needs and to remain one step ahead of its competitors.

5.5.1 Introduction to Finding Three

The word "agile" may be used in at least two different ways. "Agile" refers to being *nimble*, or being able to *move quickly with suppleness, skill, and control.* Agile also refers to the ability to be *mentally quick* and to be able to think *swiftly and intelligently*. From an IS perspective agility refers to the ability to respond and adapt to changing business conditions both within and outside the organisation.

Agility is important to e-Commerce businesses as they are under pressure to be more responsive to the changing business environment as well as the high demands of their customers. Therefore business managers and the IS function, in using a harmonised approach, have to be agile and innovative in the way in which they respond to change. The many references in the evidence that pinpointed the need for agility ranged from the evolving nature of the business environment, e.g.,

> *"This environment is like an evolution ... today you might think something works and suddenly a month from now you realise that it doesn't work and you have to react and change it" (Pike, 2005);*

> *"...so it's all about turnaround time, it's all about being like literally on the ball, real time as soon as it happens you've got to act and that's the difference in this* [e-Commerce] *business" (Meyer, 2005);*

to the competitive nature of the e-Commerce environment, e.g.,

> *"In a small market your information is so critical because you're fighting to grow; you're spending money; there's the GP* [gross profit] *that you have to play with the whole time to get the mix through the door, and one is affected by all this. In the South African situation all of this is made more complex when someone else like Exclusive Books or a Musica or a CNA suddenly starts doing a particular promotion. The customers are not loyal. They'll switch brands like anything where the price is right. Therefore you can be affected by the market today and you'll need to react to keep your customers" (Harris, 2005);*

and to the need to offer new products on the website as quickly as possible, e.g.,

> *"We cannot wait for three weeks before it goes on the site. It's got to go on immediately and they've* [referring to marketing personnel] *got to have that flexibility, and agility to do that" (De Goede, 2004).*

A number of IS management practices that are considered to improve agility were identified, viz., the ability to manage the website content; the way in which critical system errors are responded to; and the prioritisation of day-to-day ECiS tasks.

5.5.2 Manipulation of the electronic shop-front in response to changing conditions

The e-Commerce business world is highly competitive, especially since customers have a number of alternatives from which to choose the best online offering. The informants of this study, who were wary of this, articulated that they relied on ECIS to meet the demands of these competitive forces. One important aspect of this entailed the ability of the business to easily manage the website content, e.g., to be able to offer a special discount at short notice, or to add or remove new products to the website as soon as a deal was negotiated with suppliers, without incurring costs in terms of time and money.

Managers of businesses, especially those who did not have in-house ECIS support, therefore emphasised the benefit of business users being able to manage website content, independent of any intervention by IS personnel. They were of the view that any dependency on the IS function to carry out these routine tasks would reduce the business's agility. This appeared to be especially important to businesses that were operating in the virtual transaction space.[14] As one informant explained, it is about getting products as quickly as possible onto the website:

> *"Agility for business is extremely important. We get calls from potential suppliers every day. People saying that they've got products that they want to put on the site. Or a representative of Ster Kinekor will come in and say: 'We got a Shrek* [referring to a movie] *special that we want to offer immediately'. We cannot wait for three weeks before it goes on the site. It's got to go on immediately and the marketing department has to have that flexibility, and agility to do that ... it's extremely important for them. It's like the shop. The moment you got the product, it has to get onto the shelf as quick* **[sic]** *as possible ... you've got to be very quick in changing things on the site. Now it's extremely important that IT supports the marketing well with templates and abilities to do those changes" (De Goede , 2004).*

A key requirement in this regard is that systems, such as the database and web-content management systems, should provide business users with the functionality to update the website without the intervention of an IS support person. It is important therefore, that businesses procure or design systems that incorporate utilities to enable the business users to log on securely to remote servers to update the database, as well as refresh dated website content.

5.5.3 Responding to critical system problems

The informants stated that one of the foremost challenges in the e-Commerce business environment was to ensure that all components of ECIS were reliably functioning. For example, every minute during which the website is down, effectively means that the business has closed its doors to its customers. This is a reality as the nature of technology is

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[14] The *virtual transaction space* refers to one of the four virtual-spaces in Angehrn's ICDT Model (Angehrn, 1997).

such that it can fail at anytime of the day or night. When this happens it is in the interest of the business to respond as quickly as possible, to ensure that the site is up and running in the least possible time. Some business managers who had service-level agreements in place with their IS providers, relied on the spirit of these agreements for a prompt response. However, as pointed out in Finding Two, the IS function should be accountable to management when critical system failures occur. Thus the business manager has to ensure that he is in a position to influence the course of corrective action when systems fail. For example, one manager receives an automatically generated SMS on his cell-phone when a critical system error[15] occurs:

> *"And we've got an application – I think it's called a 'cal-test', which is a automatic checker against all these things* [system errors]. *This will send you an SMS saying the system is down. Basically this thing is testing all the systems constantly every few minutes. What really happens is that it sends an order every two minutes to the bank for approval. And it just runs to see whether: one, if the site is open; two, does it go through to the bank; and three, do you get a response back?" (De Goede, 2004).*

Thus a business can be considered to be agile when its managers operate as though they are doctors on 24-hour call. One informant, who managed the business in this way, took agility one step further. In addition to getting an automated SMS, he slept with his cell phone on, and had created a remote facility for him to reboot the server from his home. He did not rely on support from the IS function to respond to a critical system problem, preferring to take charge of the situation:

> *"The system is being constantly tested for uptime, 24 hours and 7 days a week. Basically there are two guys who always have their cell phones on. As for me, I've got to know what the bigger problems are. If it's a code disruption on the website – and it's very seldom that happens cause the code doesn't just change – I'm not going to know until I get in, in the morning, because I'm not going to start editing code. But if the site goes down I can see that immediately on my cell-phone. If at 3 in the morning I get an SMS – I sleep with my phone on as well – I have the ability from my house to reboot the server so I can do that; I don't need to phone our technology guys" (Bothma, 2005).*

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[15] An error which causes the website to become unavailable.

It is also possible to promote agility by innovatively structuring ECIS. For example, this informant describes how his organisation's agility was improved by the use a redundant database:

> *"We actually have three databases, with two based at our ISP. What we do is our local server and one of the SQL servers at our ISP, replicate with each other every ten minutes. Therefore our customers are seeing a live environment as well as our call centre, which transmits data over a dedicated line between the two servers every ten minutes. Why we do that is because it gives us a certain amount of redundancy. It means that if our website is ever down we can quickly put up a page that says our call centre is open and we can take orders and we'll be back up in five minutes. Equally if something happened at the call centre, the call centre agents can access the live site and do what they need to do there. However, replication is quite resource-intensive" (Bothma, 2005).*

In the event of critical systems failure, agility is also dependent on availability of human resources. For example, a national online airline has a team of three people referred to as the *"rescue paramedic team"* who will respond immediately to IS problems:

> *"We have a support team, called our rescue paramedic team, in place specifically for this business server environment and the systems environment. So what happens is we've got a specific designated individual in the call centre that actually coordinates feedback from calls that are received in the call centre. So he would raise issues that are there that's on the call centre side. He would then pass that on to the person that's responsible for – there's a team of three people that looks after that our systems – specifically the reservation system – and they would take that feedback and then go and look in the system and try and understand what caused the problem that the user experienced" (Schreider, 2004).*

However, not all businesses could afford to have in-house IS expertise at hand to deal with urgent issues. A number of smaller businesses relied on an outsourced IS function for support. Consequently, another key issue that affects agility is the service level agreements that are in place between the two parties. Many small businesses underestimate the impact on their service as a consequence of a long turn-around time from an outsourced IS provider who may have priorities with other clients at the point of crisis. The excerpt below, taken from an interview with the manager of an outsourced e-Commerce software provider, demonstrates this:

> *"They* [referring to e-Commerce business clients] *expect a lot of you – that's what I think. Or they expect more than they pay you. Now you've got to be firm about it. I say 'Yes I can do it for you, but I won't able to start it until three weeks'*

time'. And that often annoys clients, but I think it's because they don't understand that they're not my only client" (Ziqu, 2005).

Alternatively, if a business cannot sustain the financial impact of having a permanent maintenance contract with the outsourced IS provider, it would have to ensure that, as part of its contingency plans to cater for urgent IS problems, there are funds available to pay its outsourced IS provider when an immediate response is required. This emergency special fund is one of the factors that would facilitate agility. As explained by one informant who is an outsourced IS developer, they charge a special fee if work has to be done urgently without a contract:

"Sometimes there are cases when where a client needs something done immediately. Basically for that we do charge – there is a special fee, which we charge just to do it immediately – which the client is forced to accept because obviously from their business point of view the change is necessary and it's needed to be done immediately" (Ziervogel, 2005).

5.5.4 Prioritisation of IS tasks

The way in which IS tasks are prioritised impacts on the organisation's agility, especially when critical system errors occur. This does not imply crisis management, but rather stresses the need for an organised approach in which routine tasks are reprioritised to accommodate urgent ones. The complication increases in bigger businesses, where there could be a number of projects being worked on at the same time. One business used a software package to enhance its agility in task management. The manager of this business described how this works:

"We've got a system here that we call 'Clear Quest'... it's quite an elaborate management tool for IT. All users have access to Clear Quest, which they use to log all issues and problems. They log the date, time and exactly what the problem is, as well as a priority code. What we've got is one of our project managers will at every interval – not every day but every hour or two – will work through the Clear Quest logging system. So in terms of the day-to-day operation, where the things are cooking and steaming, users log onto Clear Quest, and the tasks will then get prioritised immediately. All the code 9s [highest priority] *will then get flagged immediately – and then we'll get the team leaders in immediately and we'll discuss how we will respond. The other lower priority codes will go to the weekly BPT (Business Planning Team) and we will all prioritise it there" (De Goede, 2004).*

The harmonisation of business and the IS function also impacts on agility in a situation such as that described above. The value of having a joint IS and business meeting to discuss the prioritisation of system critical tasks is obvious. The less complicated the decision-making structures are in the business, the easier it is to make quick and speedy responses to urgent IS situations. Businesses with flatter structures are more agile in decision-making. The following two excerpts underscore this point:

> *"If you are involved in a corporate set-up, the people in the backend get frustrated because they see the mistake. But to get it fixed you have to go to meetings, and planning commissions, and it takes a while until something gets done. Here if we see a mistake today, this afternoon it's fixed. It's less stress on a person" (Pothier, 2004).*

> *"And that's one of the advantages of being such a small company with a small core team – being a small team also helps in that we can be incredibly flexible and if we need to change something today we can. So it's that sort of immediate response time that I like about having most of our IT systems in-house" (Paulse, 2004).*

Agility requires a multi-skilled IS team. The IS function cannot be agile in the way it responds to critical problems, if it does not have the skills available to attend to the particular problem. The following excerpt describes the strategy used by an IS manager to encourage a multi-skilled team:

> *"We spend a lot of time mentoring the IT staff. So, for example, when we implement control procedures – like checking someone's code – it doesn't just end by saying 'No, that's not right, go back'. We always try to identify somebody whose skills you can increase, and get that person involved in the process. We find that when our whole team works in a unified way, it makes it so much easier for guys to be redeployed to areas of need. If this is successful, then the turnaround time on fixing urgent problems would be so much far* **[sic]** *up there" (Oosthuizen, 2005).*

The benefit of encouraging staff to diversify their area of expertise is therefore supportive of agility. Thus, when an urgent, critical problem arises, the IS manager has the flexibility to redistribute expertise to the area of need.

5.5.5 Summary of Finding Three

The following have been found to impact on the agility of the e-Commerce business:

- Being able to keep the content of the website accurately updated in the shortest possible time, with the least effort.
- Responding to critical systems problems both quickly and efficiently.
- Having innovative back-up systems such as redundant databases.
- Making decisions regarding the prioritising of IS tasks and the allocation of personnel to that task quickly and efficiently.

An e-Commerce business could be agile from two perspectives. Firstly, agility implies that a business, through environmental scanning and analysis is able to recognise and rapidly respond to new business opportunities. Secondly, agility from an IS management perspective implies that the business uses flexible operational structures and methods so that its systems are readily responsive to the changing environment. This finding, which focused on the latter, has proposed strategies to enhance the agility with which ECIS are managed. Thus the ability of the organisation to deliver speedily in terms of the value disciplines[16] is enhanced. Lastly, the e-Commerce business can only be agile if it has the necessary processes in place to monitor and evaluate its IS on a continuous basis. This is discussed further in Finding Five.

Finding Four /...

[16] Treacy and Wiersema (1993:84) describe the *value disciplines* as being related to operational excellence, customer intimacy and product leadership.

5.6 FINDING FOUR: Managing ECIS quality: key aspects of functionality

There is a high degree of reliance on ECIS. As such, ECIS functionality is of elevated importance in the e-Commerce business environment. A more comprehensive view of ECIS quality is required, given that effective back-end systems are as vital as a well-designed website. As customers become familiar with e-Commerce, the demands on ECIS increase. Effective e-Commerce businesses need to be able to keep up with and preferably exceed these expectations by managing the quality of key areas of ECIS functionality.

5.6.1 Introduction to Finding Four

The quality of ECIS either directly or indirectly influences the customers' perceptions of the business. Managers are therefore compelled to take an active interest in the management of ECIS quality, by paying special attention to key areas of ECIS functionality.

The results of the content analysis in Table 5.2 show that the ECIS Functionality category contained the highest number of coding instances. An introspection of the evidence in this category indicates that informants discussed ECIS functionality mainly by reference to pleasing the customer, and the implementation of business processes. This suggests that managers' views of system quality were through a business lens, and not a technical IT perspective.

This finding firstly highlights the reliance of e-Commerce businesses on ECIS, after which those aspects of ECIS Functionality that were identified as problems by informants are discussed.

5.6.2 *High reliance on ECIS*

The dependency on ECIS implies that the quality of systems is a critical factor underpinning success. As one manager put it,

> *"We're a company that relies on technology and we need our technology and the people behind the technology to be the best" (Meyer, 2005).*

The businesses that participated in this study operated in all of the four virtual spaces of the ICDT model (Angehrn,1997), viz., the information, communication, distribution and transaction spaces. The extent to which an e-Commerce business is reliant on ECIS is dependent on its objective for having an online presence. For example, a company that uses the Web to convey information only to its customers (virtual information space) on static web pages is not as reliant on ECIS as compared with a company that uses the Web to facilitate sales and the distribution of its products (virtual transaction space). The relationship between the primary e-Commerce strategy of the business and the concomitant reliance on ECIS is represented in Figure 5.5 below.

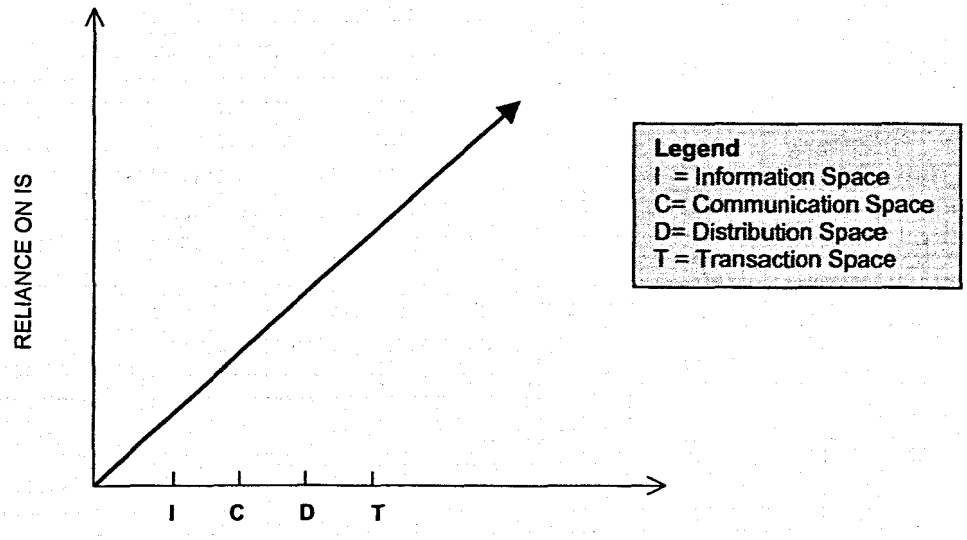

Figure 5.5: The reliance of the e-Commerce business on ECIS increases as the business extends itself from the virtual information space to the virtual transaction space

Therefore the greater the reliance on ECIS, the effort at managing the functionality of ECIS should also increase. Concepts related to ECIS

functionality that were discussed by informants, were coded under a category named "ECIS Functionality". These are presented in Table 5.2.

Table 5.2: ECIS functionality sub-categories

ECIS FUNCTIONALITY	Count	% in this category	% of Total Count
Web-interface design: *content, user-friendliness, branding, personalisation, trust, look and feel.*	68	24%	5.1%
Updating Dbase: *Being able to seamlessly, and effectively update the different subsets of data.*	34	12%	2.6%
Data quality: *Managing data accuracy and integrity.*	31	11%	2.3%
Interfaces with 3rd party suppliers: *The importance of the interface between the e-Commerce business and suppliers especially with regard to uploading the product database, and communicating product orders.*	25	9%	1.9%
IS Integration: *Integrating key IS, so as to minimise the need for manual intervention right up to fulfilment stage.*	20	7%	1.5%
Remote management of Web: *System's functionality to allow business users to independently manage the website content.*	17	6%	1.3%
CRM: *Use of IS to collect customer data to facilitate and maintain effective relationships with customers, including personalisation overtures.*	14	5%	1.1%
Security: *Keeping the business systems secure from malicious invasions, facilities for secure payments, and protecting customer data.*	12	4%	0.9%
Fulfilment: *Automated processing of orders, and seamless communication between business, suppliers and delivery agents' systems.*	12	4%	0.9%
Evaluation data: *Systems designed to provide useful data to evaluate various aspects such as website usage, sales trends, etc.*	11	4%	0.8%
Site visibility: *Site designed to enhance visibility to search engines.*	10	4%	0.8%
Speed: *Design of site to ensure serving of web pages in an optimal time; design of database should allow queries of data in minimal timeframe.*	10	4%	0.8%
Search Engine: *Effective search engine to integrate with database to provide quick, accurate responses to customer searches for products. Search engine should facilitate the collection of data regarding search trends.*	8	3%	0.6%
Site availability: *ensuring up-time of the website.*	7	2%	0.5%
Controls: *Building features into systems to reduce errors.*	4	1%	0.3%
Payment gateway: *Quick, efficient payment system.*	2	1%	0.2%
	285	**100%**	**21.4%**

Each row in Table 5.2 encapsulates important aspects of ECIS functionality, and no one can be considered unimportant. However, those sub-categories that have posed particular challenges in managing the e-Commerce business are discussed in this finding.

5.6.3 The website

The sub-categories *speed*, *site availability*, and *site visibility* had a low content-analysis count. I reflected on the possible reasons why informants underplayed these important aspects of ECIS functionality. It is possible that as these were non-negotiable expectations of their systems, their importance was considered *a priori* by informants, and thus did not warrant detailed discussion. On the other hand, the sub-category with the highest content-analysis count relates to the *web-interface design*. Having reflected on all the concepts linked to this category, it was not possible to conclude that this implied that the web interface was *the* most important aspect of the IS infrastructure. Rather, it appeared that informants tended to refer to ECIS success from the perspective of the most visible system component, viz., the website. Another reason is that website design is a well-researched topic. Therefore informants were well versed with website design and consequently this was the one aspect of systems quality that was most frequently acknowledged. It is worth noting, however, that even though this was a highly referred to concept, the informants did not discuss the website in detail. In most cases the web-interface discussions entailed cursory references such as "*easy navigation*", "*user-friendliness*" and "*ease of use*".

There were, however, other key aspects of ECIS that were discussed in detail, as informants found these to be more challenging than those related to the web interface. These were:

- Database: data quality, and database maintenance (including procuring data from suppliers).

- Remote website content management.
- ECIS integration.

5.6.4 The database

Many informants referred to the need to improve the efficiency of their inter-organisational transacting systems. The managers of e-Commerce businesses as well as their suppliers have realised the importance of databases and the concept of data quality, especially in respect of accurate and up-to-date data. The following informant sums up the importance of the quality of the database:

> *"...everything starts with the data, there's not a single thing that's not, linked to the data ... If data goes down the tubes, so will the business" (De Goede, 2004).*

Closely linked with the notion of data quality, are the processes involved in the procurement of product information, and stock availability data from third party suppliers. Obtaining data from suppliers emerged as a key challenge, especially since businesses kept their inventory costs to a minimum. Besides two national grocery chains, no other business kept goods in stock. Goods were either supplied directly by the supplier to the customer, or were based on a *just-in-time* procurement strategy. Consequently, suppliers were responsible for providing stock availability data to the e-Commerce business. However in most cases the businesses received disparate data sets from their various suppliers, and they were therefore faced with the challenge of timeously uploading the data and converting it to a format compatible with their own DBMS. In most cases this was done using email, and in a fewer cases facsimiles, since few suppliers were prepared to commit to the costs of web-based EDI or private networks. The following excerpt from an interview of an online retailer demonstrates the problem at hand:

> *"It may happen that some of the suppliers are not really used to providing the file or data in a computerised way. They may have it on a book or something because they are not big suppliers they don't need a computerised system. So we actually have to train them how to provide their files or their data to us ..., so we will often find that the file layout may change from day to day which means that we may*

> *load garbage, we may load prices instead of stock and stock instead of prices or whatever, if they switch the columns – which has happened in the past. So we had to build a system to cater for those exceptions and to check the product codes and ISBN and other identifiers of products and to make sure we are not duplicating products on our side" (Du Toit, 2004).*

The discussion in Finding One highlighted the challenge to provide both accurate and rich product descriptions to a potential customer who is contemplating a purchasing decision. As a result some managers instituted processes with checks and balances to ensure that the database update takes place with minimal problems, such as the case of the following business:

> *"There are processes which prepare the data for analysis. This is run off a staging database that is almost equivalent to the one online. And then during the middle of the night it will basically push the information through to the site, and obviously there's some processes running on the site – and all of that is automated. It's the responsibility of the database team, you know, to stand by and actually make sure that everything goes through, with a lot of checks and balances, SMSs flying around and lots of things like that" (Oosthuizen, 2005).*

Businesses operating in the virtual transaction space, especially those which had a high volume of transactions, viewed the database with such seriousness that additional dedicated IS personnel were appointed to work just on the product data. For example:

> *"We have one fulltime person doing pricing and that's just on a couple of brands, now another fulltime person will also do pricing but on other brands. Same for information, I've got about five or six database administrators, all they do is they search and source images, upload them, source the right information and upload it. The way I get around this is by literally micro-managing each product, and making sure that each product has better account managers" (Meyer, 2005).*

The foregoing highlights two important factors that impact on data quality. The first, associated with providing accurate and updated product information, is achieved by having dedicated staff focusing on this task. This is especially important if there is no integration with supplier systems. The second involves building in both checks and evaluation procedures, so that corrective action can be taken and problems rectified when errors occur.

5.6.5 Integration of ECIS

One of the implications of Finding One, i.e., CC, is that businesses require streamlined processes to fulfil customer orders as promptly and efficiently as possible. This finding therefore underscores the need to integrate key elements of ECIS.

There were varying degrees of manual processes that were used by businesses to process customers' orders. Manual processes were also used by some businesses to update the database with product-related data from suppliers. In the former, it appeared that businesses did have control on the extent of automation that could be implemented, whereas in the case of the latter the level of automation depended on the compatibility of data structures with those of their suppliers.

The following demonstrates the laborious and time-consuming processes involved with fulfilment in a non-integrated systems environment:

> *"Ok well, basically what happens is, once the order has been placed it goes onto the back-office processing system. Now what we then do is check on the availability from here, so, we'll look at the title, the ISBN number* [referring to books], *we'll check on our system if there's stock available in the store, if it's not available in the store, is it available from a local supplier, if it's not available from a local supplier, is it available from an overseas supplier? Based on that we can then estimate how much time it will take to get the book down to here and delivered to a customer. We then inform the customer that it may take seven to fourteen days to deliver" (Azeem, 2005).*

There were various problems that were experienced as a result of the lack of integration, such as the slowing down of fulfilment, and inaccurate information flow. This is indicated in the following excerpt:

> *"The information flow from e-logistics to customer servicing and ultimately to the customer, is a very manual process. And we lose a lot of time, and the accuracy of the information is affected. The guy working with it literally goes through a lot of spreadsheets... Now we're implementing from an IT perspective something that will automate this and make it a lot slicker and cleaner (Harris, 2005).*

The above points to a gap between the order management and logistics management systems. These systems are important components of

fulfilment and therefore problems that result from non-integration impact on customers' perceptions of service quality. In the following excerpt, a manager describes how a consolidated database could obviate some of the problems experienced with fulfilment:

> *"If you had one basic data structure – - and when the customer is entering his details via the website, the data is being written to the same data structure that your order system is ordering out of as well. This implies that you would have far fewer points of failure... We've never had that. We always had to write little customised files for data transfers. It actually introduced a lot of problems from the front end point of view. So I think that, that would be a good success factor, i.e., a much tighter integration between the back office and the front office" (Mjekula, 2005).*

There were many informants who expressed concern that the lack of integration between the database, order management, and logistics management systems negatively impacted on service quality when they experienced a sudden spurt of orders. This resulted in delayed deliveries and therefore militated against CC.

In Figure 5.6, the arrows between various ECIS components which represent information flows is indicative of the need for integration between all the components of the ECIS infrastructure. In this finding, however, four critical areas requiring integration (indicated in Figure 5.6 with the symbols 1 through to 4), which have been identified as problematic among the businesses in this study, are highlighted. They are:[17]

❶ Integration of supplier's and business's database to ensure accuracy and timeous update of stock availability data.

❷ Integration between the order management system and suppliers.

❸ Integration of order management and logistics management systems.

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[17] Note that the discussion that follows, use the same symbols to reference the diagram.

❹ Integration between the database and order management system.

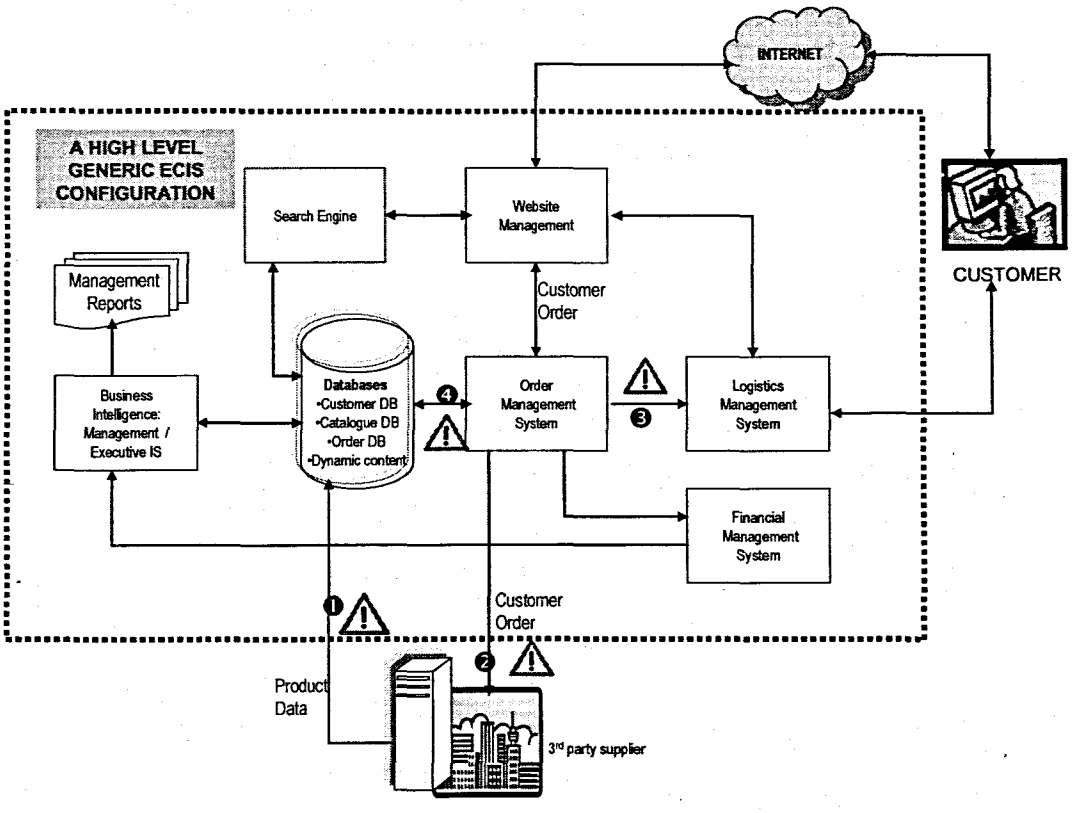

Figure 5.6: Integration between the important IS components is an important contributor to e-Commerce success

Finally, reasons why businesses did not integrate ECIS were as a result of a lack of financial resources, disparately developed in-house systems, problems integrating legacy systems with newer technology, and incompatibility with third-party systems. Ideally, the e-Commerce business that cannot implement a seamless interface between the various components of the supply chain should strive to ensure that this is not at the cost of delivering poor service to the customer.

5.6.6 Summary of Finding Four

A list of 16 important ECIS functionality issues identified in this study were presented in Table 5.2. The scope of this study did not allow an

intrinsic examination of each of these, and therefore only those aspects of ECIS functionality that were most frequently discussed by the informants were examined. Notwithstanding this, the fundamental premise of this finding calls for an integrated view of ECIS quality that focuses on all elements of the ECIS infrastructure and their associated functionality. This finding demonstrates that ECIS quality is multi-faceted and impacts on a number of stakeholders, the most important being the customer.

5.7 FINDING FIVE: Continuous assessment of ECIS

> *Although the notion of "Internet Time"[18] was substantively hyped, there was some element of truth in it. The 21st-century e-Commerce environment changes faster than did previous business eras. The primary impact of this is that the drivers of ECIS success described in the findings of this research may easily and quickly lose their relevance. As a result, organisations successfully employing e-Commerce need to continuously evaluate their performance continuously. Therefore, the implementation of a well-founded, coherent strategy for ECIS evaluation will improve the prospects of e-Commerce success. Both business and IS managers will therefore be afforded better insight into the strengths and weaknesses of ECIS.*

5.7.1 Introduction to Finding Five

This finding illustrates that e-Commerce businesses are engaged in disparate ECIS evaluation practices. There was no evidence in this

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[18] Internet time was a common catchphrase that originated during the late 1990s. In this period, people who worked with the Internet had come to believe that everything moved faster on the Internet, because the Internet made the dissemination of information far easier and cheaper.

study of a single business with a well-coordinated ECIS evaluation strategy. Rather evaluation was based on number of varying indicators of success. These ranged from anecdotal evidence of success to formal surveys of customers. Table 5.3 illustrates the different approaches that were taken.

Table 5.3: Sub-Categories of codes pertaining to ECIS evaluation

ECIS Evaluation	Count	% in this category	% of Total Count
Use of financial indicators to evaluate ECIS success: *Monitoring of profit, turnover, ROI*	52	21%	3.9%
Customer feedback (informal evaluation): *Use of informal customer feedback on website to evaluate ECIS success e.g. email complaints; telephonic queries, ad-hoc management discussions.*	38	16%	2.9%
Anecdotal references to evaluation: *Disparate evaluation concepts that were not categorised in any specific sub-category. In the main these were cursory references to evaluation during the interview.*	36	15%	2.7%
Website usage data: *site-hit rate, rate of browsers against actual sales, conversion of browsers to buyers, website usage data.*	37	15%	2.8%
Measuring business value: *Measuring ECIS success by evaluating business value e.g. increased market share, and increase in customer base.*	33	14%	2.5%
Customer feedback (formal evaluation): *Formal evaluation of customer satisfaction e.g. through questionnaire surveys.*	15	6%	1.1%
System quality: *Evaluation of technical aspects of ECIS through software testing, monitoring of bugs & errors, exception reporting etc.*	13	5%	1.0%
Business & IS perspectives of evaluation: *Business managers have different views of ECIS success compared with IS functionaries.*	12	5%	0.9%
No evaluation procedures: *Businesses that had no inclination to conduct any evaluation of ECIS.*	6	2%	0.5%
Measure against systems planning objectives: *Ex-post ECIS evaluation, using IS planning objectives as metrics.*	2	1%	0.2%
	244	**100%**	**18.3%**

Most businesses assessed ECIS success by measuring the extent to which business objectives were achieved, with financial returns being

the most often used indicator of success. There were only a few examples of businesses which measured the technical aspects of ECIS such as software bugs, upload speed, error-rate, etc. The only component of ECIS that was evaluated with some degree of thought was the website, through formal customer surveys. Surrogate measures of success, as compared with technical IS metrics, were favoured by informants.

One of the issues highlighted in the review of the literature in Chapter 2, related to the difficulties involved in evaluating IS success. The evidence collected in this study confirms that this problem is no different in the e-Commerce environment, and is perhaps one of the reasons that none of the businesses involved in this study had a coherent strategy for evaluating ECIS. Two examples from the evidence that support this claim are:

> *"To my knowledge, none of the business units have a structured way of determining the effectiveness* [of IS]*? And I go on the fact that all my colleagues in group e-Commerce spent half of this year trying to gather the stats and I don't remember there being any highlights in their report; they struggled across the board..." (Ridley, 2003).*

> *"That's very hard* [referring to evaluation] *to do – the hardest pillar in our business to measure is technology – no question. Firstly, because it's so intangible – that's the first thing and is the main problem" (Bothma, 2005).*

The following sections discuss the approaches that informants used to evaluate success.

5.7.2 Using business-aligned measures as indicators of IS success

Table 5.3 suggests that ECIS evaluation is conducted mainly by using business-aligned metrics such as profit margins, customer satisfaction, and sales targets. One of the businesses that presented a good example of this approach, monitored financial metrics such as turnover and gross profit virtually on an hourly basis. This business has a management information system, which they call the *"Business*

Intelligence System (BIS)" (De Goede, 2004; Hammond, 2004) to provide various management reports. These reports are used by managers for both strategic and operational ECIS management. The CIO of this business outlined the critical inputs into their BIS system as follows:

> *"The very first one is the turnover and when I say turnover, it is turnover per product category. And that will drill down to the kind of product within the product category, etc. So it's a detailed analysis, that is for senior management and we get it every day. We can see exactly what the turnover is, where it stands against budget and all those sort of things. Second to that is of course our Gross Profit (GP). And that goes as: If you don't have a GP you don't have a business" (De Goede , 2004).*

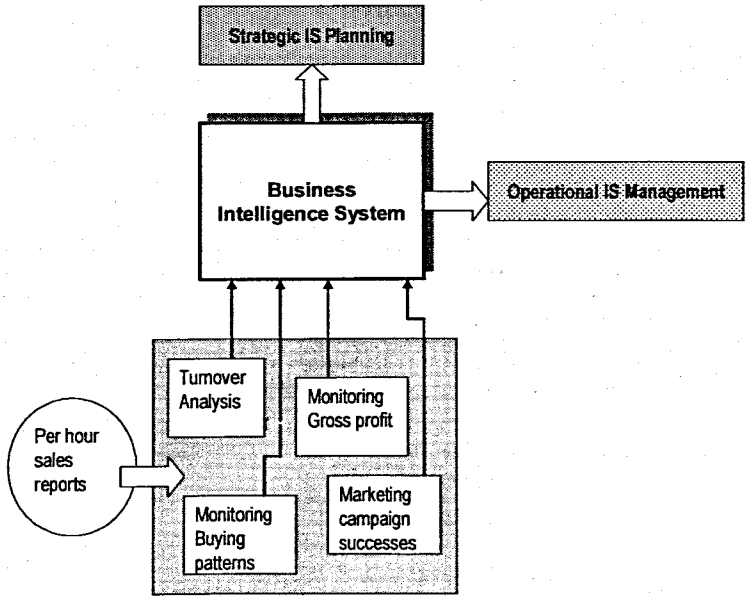

Figure 5.7: Using business value to produce management reports or "Business Intelligence" to facilitate IS evaluation

Figure 5.7 above illustrates how business-aligned indicators were used by this business to evaluate ECIS. The BIS is at the core of both strategic and operational decision-making. Information from the BIS is used for both strategic as well as day-to-day running of the business. This includes activities related to management of ECIS. As one of its

core functions, the BIS provides hourly[19] and daily sales reports, which are either used operationally or presented as detailed turnover analysis reports to senior management. Turnover is also monitored per product category which can be viewed at any time of the day. This report assists in monitoring feedback on marketing, customer profiling, and in identifying areas in which the business brand needs to be strengthened. Gross profit is also monitored daily in order that managers make decisions speedily when profits fall below expected margins. This constant evaluation of business-aligned metrics alerts the managers to ECIS problems. For example, if there is a drop in turnover, management immediately begins to examine whether there are any problems with the systems that may have caused this. In this way these metrics assist to evaluate the ECIS.

Other examples that demonstrated that managers used primarily a business lens to evaluate ECIS were:

> *"We know the constant of hits to sales is around 18%. So if suddenly it's 12% well we know something is wrong with our site. Somehow they don't get through the process as easily as they normally would or the product mix on the home page is not good. So that's helps us manage how our site works" (Bothma, 2005).*

> *"I've got to run the ship tightly from the ROI perspective. Every single day on my desk I'll know how much sales, i.e., brand new sales are coming to the business. I'll know what has been invoiced in the business. I know how many new customers have been acquired in the business. I know what discounts we have given today to customers ...Every single day I have a dashboard of the key metrics of the business. I run the business by these metrics" (Harris, 2005).*

5.7.3 Financial indicators

In response to questions concerning ECIS evaluation, most informants indicated that gross profit and turnover were used as indicators of

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[19] It is interesting that this business monitored sales by the hour. However, there is no evidence that hourly information is actually of any value in business decision-making, except in industries that deal with highly perishable goods. Generally businesses do not require such a level of detail, as it could provide a false sense of security to managers.

success. Some examples of responses from business managers regarding how they evaluated success were:

> *"Well primarily it's the number of transactions we do, and the value attached to those transactions. That I would say is your most clear indicator of the success of our systems" (Azeem, 2005).*

> *"There's a few key performance indicators which have to be in place, and those KPIs are turnover. But more important than turnover is what margin you are making on that turnover. They say that this is 'turnover vanity', so it's not wrong if we brought in a hundred million rand. But are we making money? So there is the turnover target, the margin target, the number of order targets"(Meyer, 2005).*

> *"We are not really interested in how many hits are we getting in daily, we just couldn't care. We're interested in how many orders do we get a day. That is the critical measurement of our systems, how many orders a day" (De Goede, 2004).*

As profit is normally regarded as the main objective of business, the views expressed above may be satisfactory if one were to take a narrow view of ECIS success. However, businesses that evaluate success purely on financial indicators may, in focusing on this alone, make it more difficult to plan ECIS. As indicated in Finding Three, the e-Commerce environment is a dynamic one, and if profit is the only indictor of success, it would be challenging to make ECIS improvement decisions that would assist the business to cope with a changing environment.

5.7.4 Measuring customer satisfaction

User satisfaction, or in the case of e-Commerce business, customer satisfaction, has been well documented in the literature as a surrogate indicator of IS success. Therefore it was surprising that only a few businesses actually used formal customer survey instruments. Rather businesses tended to rely on informal feedback from customers, as demonstrated in the following excerpts:

> *"The key evaluation for us is what happens on the website and that evaluation takes place in two ways: the one is the informal feedback from the public and the second one is actual hard numbers" (Schreider, 2004).*

> *" .. we get feedback from customers through telephone calls, and emails saying 'listen, why don't you have x, y and z', so we listen and now we're implementing those things, putting them onto the site so our customers have that functionality they asked for (Azeem, 2005).*

> *"We are very fortunate because we are a busy retailer; we get alerted by our customers straight away. We don't have any mechanisms that help us monitor that, for example, there is something wrong in our shopping basket. But we know about it straight away because automatically our call centre lines light up. If I didn't have that, I think I would have to build some systems where there's something testing processes all the time – but fortunately we don't need that (Bothma, 2005).*

Of course, customer feedback will generally give a business an evaluation of the web-interface only. Businesses need to go deeper than just website evaluation since there are many other key backend ECIS that contribute to the e-Commerce operation. In addition to customer satisfaction, many of the notions expressed by informants in respect of customer feedback were concepts aligned to service quality. For example:

> *"So already you know that they are quite surprised by the quick turnaround time which increased the service level, they are very impressed by that. So we have the whole package deal where customers feel: 'Wow, you know this is a good product, this is a person that knows what they're doing'. That's what is driving our success. And customers are happy, and then their risk is minimised completely and by the time they get their order they're already sending their email back saying, 'Great, thanks, stunning, thanks for the great service'. You know, those are the responses that I'm getting right now. So I'm giving it and I'm getting it back and so I think that's a sort of a test, that it's working to put it that way" (Wannenburg, 2005).*

However, as is the case with customer-satisfaction, although service quality metrics are well documented in the literature, none of the businesses actually did any formal service quality evaluation.

5.7.5 *Evaluating website usage*

Another area that businesses used as a gauge of ECIS success was website usage. There are various software packages, such as *Web Trends*, that were used for this purpose. For example, one informant said the following regarding the use of such packages:

> *"I mean there are a lot of products that do this but they give you a lot of data, they don't give you any information, and generally you have to extract that and interpret it for people. They can interpret it themselves but it's generally hard work and quite a few people do it" (McGregor, 2004).*

However, these packages only provide raw data, and the effort is in converting this data into useful management information, which many managers were not capable of doing. Examples of how managers found statistics concerning website usage of value were:

> *"The one thing that we were watching was really the number of hits that went into the site. This gave a broad idea of success" (Vennard, 2004).*

> *"The hit rate has increased phenomenally like a good few 100% and we're talking about in broad numbers from 80 visits a day to 220 visits. So for us that was a huge success" (Poswa, 2004).*

> *"The last time I went on the Net checking out how many hits we had, it was increasing. You know as long as it's increasing, as long as a lot of people are logging on, that's a good idea of success (Pumela, 2005).*

Reference to the use of website statistics to evaluate success was common in the evidence. However, the point has to be made, that this in itself is not a useful indicator of ECIS success. For example, it is short-sighted or possibly even naïve to believe that a drop in website hits from 18% to 12% is an indicator that *"something is wrong with the website"* (Bothma, 2005). Rather, businesses need to have an overall gauge of ECIS success, which should include evaluation of the back-end ECIS as well.

5.7.6 Summary of Finding Five

ECIS evaluation practices were generally fragmented, and not based on a well-designed set of evaluation objectives. The high incidence of informal evaluation practices is a concern. It is not possible to recommend any single method of evaluating ECIS. Rather e-Commerce businesses should engage in a multi-pronged strategy of assessing the key areas of success highlighted in these findings. Feedback on these issues would in turn give managers a holistic perspective of the success of ECIS.

5.8 FINDING SIX: A new focus on ICT as a direct facilitator of business success

> *ECIS performance is more easily understood through a business lens, as opposed to a technical, IS-oriented lens. In an e-Commerce environment, ECIS success should be a general management concern at the highest level. The ability of ECIS to service the web-based business initiative is regarded as being of paramount importance to the success of e-Commerce. ECIS success is therefore dependent on how effectively the business model has been conceptualised and implemented.*

5.8.1 Introduction to Finding Six

The importance of ECIS, as articulated above, may possibly be just as relevant in the brick and mortar business domain. However, IS success has not previously been perceived as being a central business management issue. This finding focuses on the importance of ICT and is a major contribution in elevating the prominence of IS by relocating it from a "back-office" concern to that of a critical success factor from a business perspective.

The gist of this finding articulates that successful ECIS is associated first and foremost with the operationalisation of a well-planned e-Commerce business model. The evidence collected points out that all the notions associated with the e-Business-related hyperbole of the 1990s have been whittled down to the fact that basic business principles still apply and that there are no magically derived profits to be made from an e-Commerce venture. Business entrepreneurs now realise that creating a web-based sales medium in itself is not sufficient to realise profits. Indeed, many of the informants confessed to having subscribed to

various elements of the hyperbole when they started out their businesses. Two examples of references to this were:

> *"However in 2001 around April – May, when the dot bomb happened and crashed, so then we had to take business much more seriously. Now we had to have an actual business model – before that we were kind of just riding on the Internet wave. Now we have had to view this as a viable business proposition independent of any kind of hype" (Bothma, 2005).*

> *"...and that's the truth of how our business started – we got these guys to develop an online store and we hired one or two people to kind of manage the store, source products and do the books, take the payments, do the logistics and we were getting maybe around about one or two orders a day within the first month. After about a year of that those one or two orders were only 10 to 15 a day – and it was never a profitable business. But we were always saying, that we were taking over* [believing that they were going to be profitable] *and we were thinking at that stage: 'That's great that this is happening and within three years we are going to be retired, living in the Seychelles and it's going to be all fantastic'. And then this IT bomb hit South Africa!!!" (Meyer, 2005).*

One informant, when asked what was different between his online e-Tailing business and a physical store, stated quite categorically that

> *"... there is no difference between an e-Commerce venture and a brick & mortar business" (Rutter, 2005).*

Another informant explained that

> *"I think at the end there is not much difference between e-Commerce and any other business. It's actually just increased use of technology to facilitate the business." (Pike, 2005).*

Views such as these reinforced the importance of business principles as opposed to the importance of the technology. This therefore implied that ECIS success was inextricably linked with business success. There are views of IS success, however, that could be offered to counter this. For example in taking a *systems quality* view of IS success (Delone & McLean, 2004), one could argue that if the system is technically sound then it is successful. However within an e-Commerce context, the question is whether this sufficiently explains the concept of success. From the evidence in this study it appears that success is associated firstly with how well IS supports the business initiative. Thus the concept of ECIS success extends beyond that of technical success. Indeed, the majority of responses from both IS and business informants to questions

concerning ECIS success (refer to Table 5.4) pertain to concepts related to the achievement of business objectives.

Table 5.4: Business management sub-categories demonstrate substantive reference by informants to business-related concepts of ECIS success

Business management sub categories	Count	% of this category	% of total codes
Business principles apply: *Responses from informants that demonstrated that business principles are more important the IS, and that poor business processes are more likely to lead to e-Commerce failure as compared with poor IS.*	49	20%	3.7%
Robust business model required: *Responses that either directly or indirectly attributed e-Commerce success to the implementation of a particular type of business model.*	43	18%	3.2%
Marketing: *Concepts related to the marketing of the business through different media.*	32	13%	2.4%
Procurement of goods: *The management of the procurement processes was considered an important activity by informants.*	21	9%	1.6%
Lack of IS knowledge: *The lack of technical and management experience was highlighted as an impediment to success.*	21	9%	1.6%
Business strategy drives IS strategy: *Business principles were prioritised in making decisions regarding IS.*	20	8%	1.5%
Daily management: *Refers to routine management tasks that needed to be undertaken on a day-to-day basis.*	16	7%	1.2%
Strong business experience: *Indicates that prior substantive experience in business had a positive impact on success.*	9	4%	0.7%
Management reports: *The use of management reports in decision-making.*	8	3%	0.6%
Top management support: *Refers to the need to have top management support for the procurement and effective management of IS.*	6	2%	0.5%
Change management: *In brick & mortar businesses change management strategies were an important factor to manage the introduction of web channels.*	6	2%	0.5%
Business management (general): *Concepts that were not coded in any of the subcategories.*	5	2%	0.4%
Manage environmental factors: *Refers to the impact of various influences external to the business and the strategies used to manage them.*	4	2%	0.3%
Project management: *Relates to the involvement of business managers in IS projects.*	3	1%	0.2%
Disaster recovery plans: *Plans to re-institute ECIS and bring the business back to operational level after a disaster.*	1	0%	0.1%
	244	**100%**	**18.3%**

5.8.2 ECIS: A facilitator of e-Commerce success

ECIS problems that were discussed by informants were associated with the way in which business processes were implemented and managed rather than with the technology. As one informant explained,

> *"It does not mean that the project is a failure* [from an IS perspective] *if we did not achieve our targets. But you know a 5% reduction in inventory could save a company millions, so we need to understand why that happened – and maybe you rectify it through fine-tuning. And generally we find that it's not a problem related to the software but of the* [business] *process. The software solution usually works – especially if it is a COTS* [referring to Commercial Off the Shelf Software] *– it works in many other places. So what needs to work are the processes and the people who drive the process in the organisation and that's generally where the failure comes from" (Mitchell, 2004).*

The foregoing demonstrates the importance of ECIS as a *facilitator* of business processes. The following excerpt from an interview with the managing director of an international wine e-Tailer, further demonstrates this point:

> **SP:** ***"From your perspective, what would you say are the main factors associated with your success?"***
>
> **FP:** *"Focus on the product not the system – what I mean is that we are a wine company, and we use the Internet to the utmost capacity in terms of sales and communication and everything else – but I very rarely define the company as an e-Commerce company. I define it as a wine company" (Paulse, 2004).*

Examples such as the latter point towards the business proposition[20] being, in the first instance, a key ECIS success issue. Therefore managers of e-Commerce business ought to evaluate the business processes carefully before questions about ECIS success can be considered. One e-Commerce manager makes this point by suggesting that

> *"...as long as the business objective is a sound objective and has been thought through by somebody from a commercial perspective, then they can bring the IT people to do the work" (Cruywagen, 2004).*

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[20] This refers to the value proposition that the business offers a potential customer, i.e., the value created for users by the offering based on the technology (Eisenmann, 2002). Internet-based businesses need to offer a clear and compelling benefit to the online shopper, which in turn attracts the customer to the site and provides the raison d'être for spending money.

Another manager who regarded the business processes as more important than the ECIS, made the following comment:

> *"Customers are not going to think much of our business now are they? They're hardly going to say to their friends: "You've got to use that business – they've got the coolest technology – they don't deliver the goods – but they've got the coolest technology!!!" (Bothma, 2005).*

An e-Commerce software developer who also recognised the value of having sound business processes in place suggested that,

> *"...high-risk clients are those who don't have defined business models. In other words, it is anyone who doesn't have an existing business, and they don't have their processes in place when they contract out to us. They basically rely on us to develop their business on the Internet. The risk for those individuals is very high. The risk of failure is very high. If you have an existing business model that works, and you are starting a new medium and you are opening a new revenue opportunity for your business, then your chances for success are far better"(McGregor, 2004).*

5.8.3 The importance of the e-Commerce business model (ECBM)

Examples of failure with e-Commerce pointed to problems with the business model. For example, two national companies, after considerable expenditure, closed down their e-Commerce operations.[21] In neither of these cases were problems with ECIS contributory to the shutdown. In fact one informant (Vennard, 2004) actually boasted about the awards they had received for their website. Rather, the causes of failure in these two instances were attributed to a poor understanding of the target market. Managers who were in charge of the e-Commerce projects stated that their customers were not willing to switch to the online channel (Vennard, 2004; Chiles, 2005). There are two possibilities that could account for this. Firstly, the informants concerned

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[21] The companies concerned were (i) a national chain of grocery stores; (ii) a no-frills discount store selling a range of goods, from large appliances to stationery. Both these companies eventually shut down their e-Commerce sites, after realising that the costs of maintaining their infrastructure far outweighed the income they generated.

suggested that their customers were not sufficiently web-savvy so as to take advantage of the online offering. The second more probable cause of failure concerned the fact that these businesses did not implement an ECBM that offered an attractive value proposition to customers. In both cases there was no value added for the customer who used the online channel of these businesses.

The ECBM was also found to be inherently associated with a number of the challenges of managing ECIS. For example, one of the recurring problems concerned data quality and the processes applied to update the product database. If this problem is considered in isolation, it does not really appear to be unique to the e-Commerce environment.[22] However, when the issues around the management of the database are weighed against Findings One to Four, then the reason for its importance within the context of an e-Commerce business becomes much clearer. This demonstrates how the uniqueness of the e-Commerce business model impacts on ECIS management. The distinctiveness of the e-Commerce business model therefore is the foundation upon which critical success factors of ECIS rest.

Having reflected on the 34 organisations involved in this study, the following key elements of the ECBM (in an e-Tailing context) were identified:

- An e-Commerce business is based on a model that compels the distribution of goods to customers. In this model, the business procures goods for sale, and has to find the means to distribute these goods directly to the customer.

[22] Data accuracy and integrity are important considerations to any business, be it e-Commerce or brick and mortar. Thus any organisation that maintains a database will need to subject its database design and data loading procedures to careful planning.

- The e-Commerce business is a direct marketing organisation.[23] All the principles applicable in a direct marketing environment are also applicable in the e-Commerce environment.
- While it is a generally accepted business norm to be able to satisfy the customer, the expectations of the customer are generally higher in the e-Commerce environment.
- Customers have an expectation of personalised service. As a result, the e-Commerce business has to be responsible for maintaining accurate data about their customers, even though they may have shopped on the site only once.
- The e-Commerce business has to maintain significantly different relationships with their suppliers. Whereas B2B relationships are an option with brick and mortar business, they are a critical component of the e-Commerce business.

The five elements of the e-Tailing ECBM described above are important considerations in this finding as the e-Commerce organisation is largely reliant on ECIS for its successful implementation.

5.8.4 Summary of Finding Six

Finally, Figure 5.8 summarises the salient points of this finding. The diagram illustrates that there are two important inputs to the ECBM, viz., e-Commerce business strategy, in the form of a viable value proposition, and IS strategy.

Figure 5.8/...

[23] The direct marketing strategy has been used by business for some time in the pre- e-Commerce era. In this model, businesses marketed their goods through television and print media (newspapers, magazines, posted brochures). Customers would then either order goods through the post, or by telephoning a call centre. The goods would then be delivered directly to the customer.

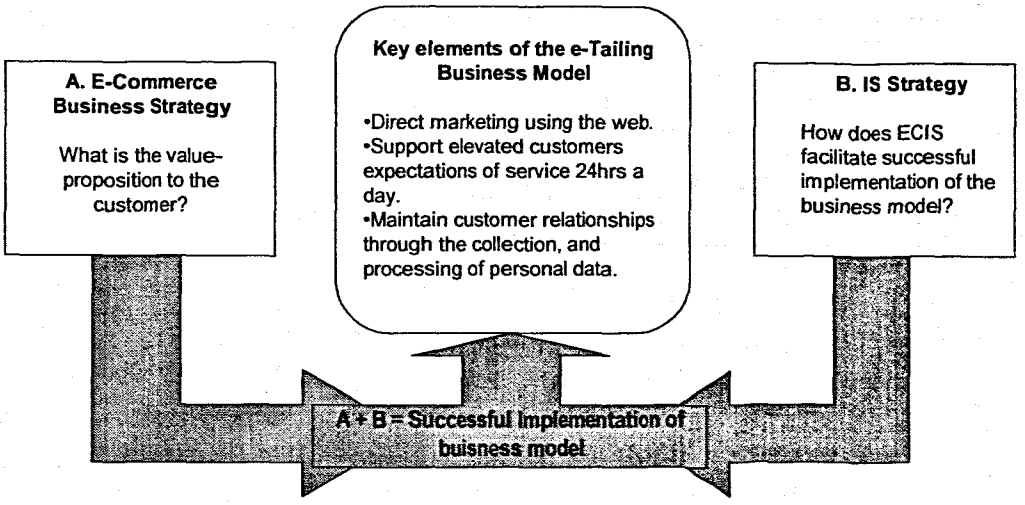

Figure 5.8: e-Commerce success is facilitated by business and IS strategy

Jointly, both these elements of strategic input are important facilitators that are required to successfully implement the ECBM. This in turn underscores the fundamental premise of this finding, viz., the ability of ECIS to service the web-based business initiative is regarded as being of paramount importance to the success of e-Commerce; and that ECIS success is therefore dependent on how effectively the ECBM has been conceptualised and implemented.

5.9 Conclusion

This chapter, in forming the cornerstone of this thesis, has presented six findings in response to the research questions (Refer to Table 5.5).

Table 5.5/...

Table 5.5: A correlation between the research questions and the six findings

		RESEARCH FINDINGS					
		CUSTOMER CENTRICITY	HARMONISATION OF BUSINESS & IS MINDSETS	AGILITY OF THE IS FUNCTION	MANAGING ECIS QUALITY	CONTINUOUS EVALUATION	ECIS : DIRECT FACILITATOR OF BUSINESS SUCCESS
RESEARCH QUESTIONS	How does ECIS contribute to successful business?	✓		✓		✓	✓
	What are the drivers of ECIS success?	✓	✓	✓	✓		✓
	What are the important management issues that affect the success of ECIS?	✓	✓	✓	✓	✓	✓

These findings have brought to the fore the following:

- Firstly, the nature of the ECBM is such that any negative impact on the customer, will lead to business failure. This requires that ECIS, in supporting the implementation of the ECBM, should be customer-centric in the way it is designed and managed. This implies that ECIS at all levels of the business should be considered in terms of its direct and indirect impact on the customer.
- Secondly, successful ECIS is dependent on the extent to which business and IS stakeholders are harmonised in their approach to IS management. It is clear the ECIS is not the domain of the technical IS personnel only. Rather it is a combination of a harmonised business and IS grouping that leads to success.
- Thirdly, the e-Commerce environment is subject to constant change. As such, the organisation is required to be agile in the way ECIS are managed in order that the systems are able to support the constantly evolving needs of the business and its customers.

- Fourthly, there are key aspects of ECIS functionality that warrant special focus in terms of quality. The maintenance of quality of these ECIS components is critical in ensuring that business objectives are successfully achieved.
- Fifthly, e-Commerce businesses are required to evaluate ECIS using more formal evaluation procedures. These procedures should be instituted to measure ECIS in terms of quality, how it impacts on the customer, and the way in which it supports the business model.
- Lastly, the success of the ECIS deployed in an e-Commerce business is underscored by a carefully planned business model. Therefore ECIS success needs to be understood through a business lens as opposed to a technical lens. The unique pillars of the e-Commerce business model imply that ECIS is a direct facilitator of e-Commerce success, and therefore has an elevated importance when compared with brick and mortar businesses.

The juxtaposition of the six findings presented in this chapter is used to derive the ECIS Success Theory. The relationships between these findings and the resultant theory are discussed in Chapter Six.

CHAPTER SIX

ECIS SUCCESS: A THEORETICAL CONTRIBUTION & CONCLUSIONS

"Obviously the work is not finished, and can never be finished. There are no absolute positions to be reached in the attempt by men to understand the world in which they find themselves"

(Checkland,1986: xii)

Overview

This chapter brings the research to a conclusion, by presenting an ECIS Success Theory, which is an original contribution to the body of knowledge. The chapter firstly discusses how the theory was derived from the findings, after which the importance of the new theory and its relevance to e-Commerce businesses and academe are examined. Following this, the research outputs are evaluated in terms of three fundamental qualitative research criteria, viz., credibility, transferability and dependability. The latter includes a presentation of a research audit trail. Several limitations of the study are reflected upon, before avenues for future research are discussed. The chapter ends with a conclusion that the research has been valuable both to the researcher, and also to the community of stakeholders in which the research was conducted.

6.1 Introduction

The findings in the previous chapter, which have provided insights into the factors affecting ECIS success, collectively serve as a set of management guidelines for the e-Commerce environment. While the bedrock for this work was the extant literature, it was these findings that provided the foundation upon which the final outcome of this study is derived. Using the adopted framework for theory development as a guide, and through further reflection, this chapter integrates these research findings, into a theoretical contribution.

In their seminal work on grounded theory, Glaser and Strauss (1967) claimed that theory had become synonymous with the theories of the great men such as Marx, Weber, Durkheim, Mead, etc. These theories

would then be confirmed by "*subsequent, less brilliant minds through short-sighted exercises in verification*" (Alvesson & Sköldberg, 2000:16). It was against this premise that Glaser and Strauss launched their rather liberating thesis that anyone can create their own theory, so long as they start from reality, and therefore

> *" ... not only geniuses and theoretical capitalists can be creative in social science research. Even ordinary mortals can generate creative input as scientific entrepreneurs; they do not have to act as a verifying proletariat serving intellectual big business"*
>
> (Alvesson & Sköldberg, 2000:16).

Although this quotation is perhaps an exaggeration, these authors make a valuable point. They bring to light the strides that social scientists have made since the 1960s in the area of theory generation. As a result of the work of Glaser and Strauss, it is now widely accepted that even postgraduate students are capable of developing theory.

The theory presented in this chapter, which has been inductively grounded in evidence collected from knowledgeable informants, is my contribution to the body of theoretical knowledge.

6.2 The derivation of an *ECIS Success Theory*

The final stage of theory development entailed establishing relationships between the findings. The six findings that were derived were:

- Customer-Centricity.
- Harmonisation of Business and IS mindsets.
- Agility of the IS function.
- Managing ECIS quality: Key aspects of functionality.
- Continuous assessment of ECIS.
- A new focus on ICT as a direct facilitator of business success.

Of course a list of findings cannot be the only outcome of a doctorate, as Henning (2004: 117) suggests:

> *"Theories are not lists of findings, but coherent arguments that explicate and explain social processes and phenomena. The strength of the theory will depend on the power of the data, the clarity of both gathering and analysis procedures, and the ability of the researcher to conceptualise concrete detail. This conceptualisation process is infused with elegant analysis and synthesis of empirical detail. A thorough grounded theory study is thus a deeply reflexive activity."*

In developing the theory I carefully studied the findings several times, interacted with the evidence to clarify the positions that were taken, and engaged in reflection[1] on the evidence. During this period of reflection I found myself searching for a set of rules that would guide the theory formulation. However, I soon established that there were none, with authors such as Remenyi *et al.* (1998:79) offering the following advice regarding theory development:

> *" ... there is no structured methodology for doing this* **[developing a theory]**. *Rather this aspect of research or scientific study can be regarded as an art that relies almost entirely on the imagination and creative abilities of the researcher. It is precisely here that science and thus research becomes truly creative".*

Thus through a combination of reflection and creative thought, I made the following observations:

- The first finding, which dealt with the importance of CC, is a focal point, enabling all other findings to flow from it.
- Customer-centric ECIS are managed with an emphasis on agility, and the implementation of decision-making mechanisms and organisational structures that promote a harmonisation of business

[1] This included applying hermeneutical interpretation, i.e., constant comparison of parts to the whole. Using hermeneutic terms, in this instance the six findings were the parts, and the whole was the emerging ECIS success theory.

and IS mindsets. These are important ECIS management considerations that support the deployment of customer-centric ECIS.

- CC is sustained through the development and management of reliable ECIS. Several key areas of ECIS functionality were identified in this respect.
- CC is embedded in the e-Commerce business model, which incorporates both business and ECIS strategy. This model is the foundation that provides the e-Commerce organisation with a sense of clear purpose and direction in selecting, developing and managing ECIS.
- CC is sustained by the implementation of a coherent strategy which enables the e-Commerce business to continually evaluate the drivers of ECIS success.

The foregoing represents the result of applying reflection and creativity to the findings. It arose through a series of thought experiments, the objective of which was to establish a credible explanation of the interrelationships between the findings. Figure 6.1 presents the outcome of this process.

Figure 6.1/...

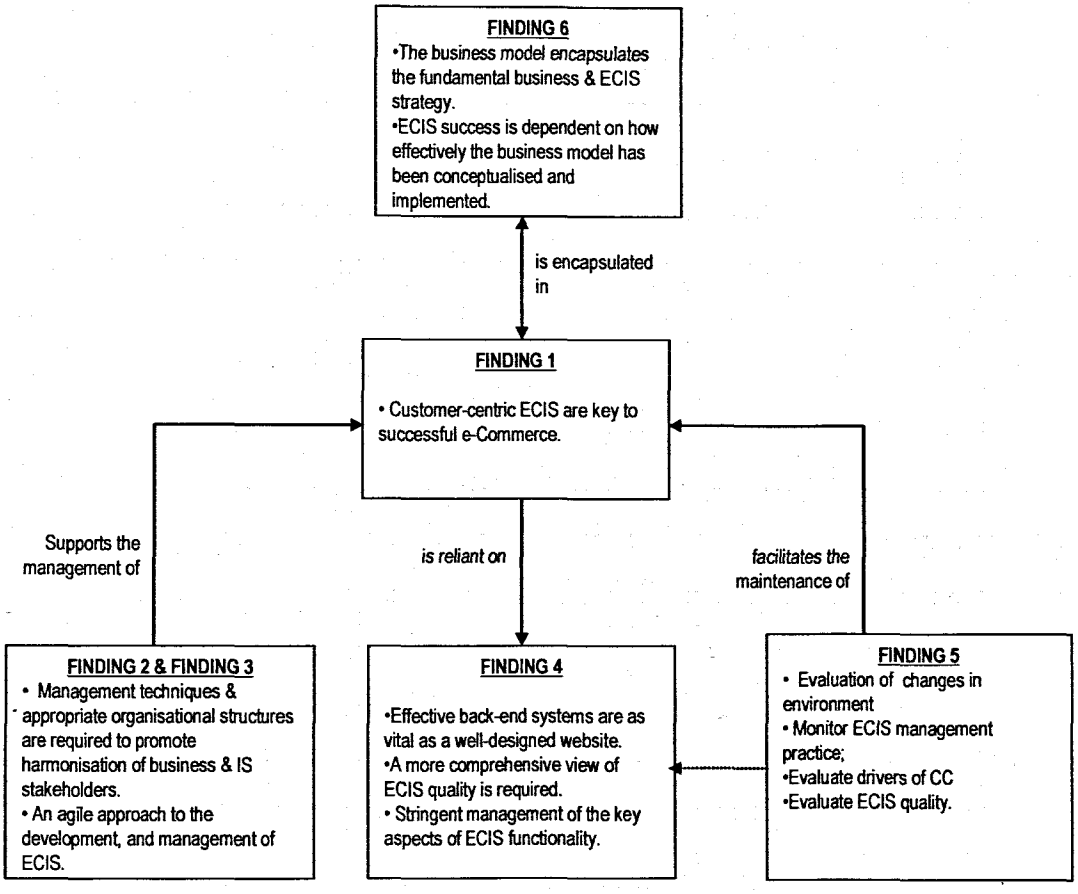

Figure 6.1: The linking of findings through reflection and creativity

Although this diagrammatic representation is organised linearly, it does not imply that its derivation arose through linear thought processes. Rather it was through constant interaction of the findings, the raw evidence, and the comments from informants during the verification phase of the research that influenced the creativity in seeking out the relationships. This process eventually led to the derivation of an ECIS Success Theory, which is stated on the following page. The theory was also subjected to further reflection, and is represented diagrammatically in Figure 6.2. According to Miles and Huberman (1984), whereas in the physical sciences a theory will frequently be expressed as a formula or as a series of simple propositions, in business and management research the theory is often reduced to a diagram for the purpose of clarification.

ECIS Success Theory

ECIS success is underpinned by a mindset, which sees Customer-Centricity (CC) as one of the primary drivers of e-Commerce. CC pervades the key e-Commerce processes. However, CC alone is unlikely to lead to an optimal e-Commerce solution. For sustained success, business and IS mindsets need to be harmonised. Additionally, as customers' tastes and preferences change, so too should the ability of the business to be responsive to these changes. Responsiveness is realised through the design of agile processes and systems. Implicit in the understanding of these three critical success factors, viz., CC, harmonisation, and agility, is that e-Commerce processes are supported by high quality ECIS that are reliable and easy to maintain. To ensure success, all four of these factors need to be integrated into a competent business model. ECIS success will be sustainable by the continuous assessment of CC, harmonisation, agility, changing environmental factors, and the quality of ECIS.

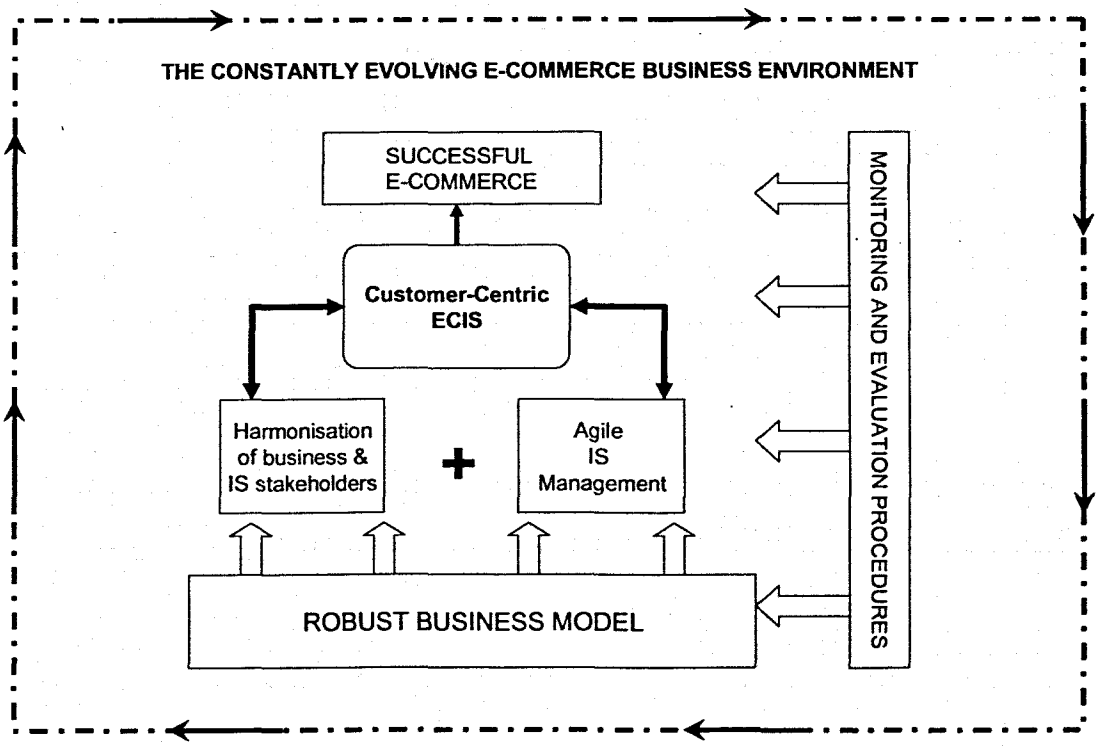

Figure 6.2: Diagrammatic representation of the ECIS Success Theory

6.3 Importance of the findings

Currently researchers have taken diverse approaches to the study of ECIS success, with equally diverse foci in respect of the units of analysis. This has resulted in a fragmented body of knowledge.[2] There are several possible reasons for this. As a phenomenon of the 1990s, e-Commerce is relatively new, and as such the body of research in this field is still evolving. This is clear when one considers the lack of theoretical underpinning in several studies, and the eclectic range of theories that has been applied in others. Another possible reason is that many researchers have attempted to adapt theories and models that have been applied to the traditional brick and mortar business domain, without a more comprehensive understanding of e-Commerce.

During the e-Bubble era a proper understanding of the role of management in e-Commerce was hindered by talk of the new economy.[3] During the nascent years of e-Commerce, it was suggested that the fundamental rules of business related to profit and cash flow had changed. The reality is that there may or may not have been a new economy, but there certainly was no new economics. This type of thinking distracted e-Commerce businesses from sound management practice, as it was believed that the implementation of web-based technology in itself was sufficient to lead to profits. Thus the value of the ECIS Success Theory is that it refocuses our attention to the importance of both business and IS management in the e-Commerce environment.

There has been a lot of disinformation about how e-Commerce works. This theory offers a means of dispelling the myths that have entrenched

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[2] The pre- e-Commerce body of knowledge has also been criticised as being "non-cumulative and fragmented, lacking an overarching framework..." (Grover *et al.*,1996: 178).

[3] There is no clarity as to when the notion of the "new economy" was first articulated, but it was during the early 2000s (Toffler & Toffler, 2001). The new economy was heralded as a fundamentally new way in which economies or economic systems had begun to operate (Patel & McCarthy, 2000).

themselves since the e-Bubble era. The ECIS Success Theory thus offers a more comprehensive view of the challenges involved in managing e-Commerce business rather than the eclectic and inchoate ideas that have largely prevailed to date.

The theory produced in this study is also of value in that it provides a coherent understanding of ECIS success, through the juxtaposition of a number of areas of study. The theory addresses the areas pertaining to business strategy, IS strategy, business and IT alignment, and IS evaluation. In the area of IS evaluation, the ECIS Success theory takes current research a step forward. Whereas a number of studies have focused on specific metrics to evaluate ECIS,[4] the metrics exist in isolation from a comprehensive understanding of ECIS success. Thus the *ECIS Success Theory* provides a context to assist our understanding of factors that affect ECIS performance. Additionally, the theory provides a framework within which to enhance existing approaches to evaluating ECIS success, and a basis upon which new ones can be developed.

Indeed during the confirmatory phase of this study, which involved interviews with several additional e-Commerce managers, as well as South African and overseas IS academics, there was mainly positive feedback regarding the findings and the ECIS Success Theory. Some of the comments made were:

> *"These findings are right on the money. Some of these findings bring to the fore lessons we learnt the hard way. This is certainly important to us, and especially the newer guys" (Potts, 2006);*
>
> *"This actually represents what I would consider to be best practice, and if we had this kind of comprehensive understanding seven years ago when we started, we would have avoided many of the mistakes that we made... This is also presented in a way that is easy to digest and understand" (Harris, 2006);*
>
> *"If start-ups are schooled with this type of knowledge, they are bound to have a better chance of success. When we started out, we had to literally think on our feet, and learn along the way" (Azeem, 2006);*

[4] See DeLone and McLean (2004) for a comprehensive review of IS evaluation metrics in the e-Commerce domain.

> *"What you have presented here, tells me that you probably have the best understanding of the mechanics of e-Commerce –more so than we ourselves have" (Poswa, 2006).*

It was also pointed out that the development of an ECIS Success Theory is timeous in that the South African e-Commerce business climate has become competitive:

> *"This seems to be the absolute right time to highlight findings like these. We're experiencing more and more competition, and your findings help to pinpoint important issues that we have been experiencing" (Azeem, 2006).*

The foregoing statement by Azeem, alludes to the low Internet adoption rate by consumers that has characterised the local South African market. Until recently the online retail market had been dominated by a few e-Commerce businesses only (Goldstuck, 2002; Goldstuck *et al.*, 2006). However, the climate is changing as more businesses adopt Internet-facilitated business. Therefore research such as this will be of value not only to the e-Commerce sector at large, but more especially to the SME sector. There have been several examples quoted of small business entrepreneurs who have experienced great difficulty as they are "*daunted by the complexity involved*" in setting up their business on the Web (Tulleken, 2006:3). It is therefore important that the findings of this study are of value to both academe as well as industry-based e-Commerce stakeholders.[5] Thus, in compiling the findings, I took into account the criticisms that have been levelled at the value of management research (Starkey & Madan, 2001) and that of the relevance of empirical IS research (Benbasat & Zmud, 1999).

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[5] One of the motivations for this study was to contribute to our understanding of ECIS success, so that the SME sector in South Africa would be able to harness the Web and the Internet with more success. Mainly owing to apartheid policies, the SME sector in South Africa is characterised by entrepreneurs without post-school qualifications. As such, they would require knowledge in a simple format, which is easy to digest and apply in their businesses.

Remenyi and Money (2006) advocate that it is not necessary for a theory to be a complete explanation of a phenomenon. This is supported by Strauss and Corbin (1998:266-267), who posit that a substantive theory (one developed from the study of one small area of investigation and from a specific population) does not have the explanatory power of a larger, more general theory. It cannot, because it does not build in the variation or include the broad propositions of a more general theory. The real merit of a substantive theory lies in its ability to speak specifically for the populations from which it was derived (Strauss & Corbin, 1998). The positive feedback by informants during the confirmatory phase of the research therefore suggests that the ECIS Success Theory is meritorious.

In summary, the e-Commerce practitioners who participated in the final phase of the research were supportive of the relevance and comprehensiveness of the six findings and the ECIS Success Theory. This, therefore, has positive implications regarding the relevance and usefulness of this research to organisations involved in e-Commerce.

6.4 Evaluation of the research

In keeping with the qualitative tradition, the principal evaluation approach that I have adopted is one of confirming the research as opposed to arguing for its reliability and validity. This involves various strategies to enhance the credibility, transferability and dependability of the research findings.

6.4.1 Credibility of the research

The credibility of this research can be attributed to the use of three strategies:

- Triangulation.
- Referential adequacy.

- Submission of the evidence to checks by members of the research community (referred to as *member checks*).

Triangulation refers to extending understanding, or adding breadth and depth to analysis, through the use of multiple perspectives (Ritchie, (2003:43-44). In this study, the interview transcripts formed the primary source of the evidence. Multiple perspectives of this evidence were obtained from documentation supplied by informants, and information gleaned off the websites of the businesses studied. In addition to this, extensive field notes that were taken during the interviews were used to crosscheck interview transcripts. Summarised versions of the transcripts were also used.[6]

Referential adequacy relates to providing proof of the existence of the evidence that has been collected. All the tape recordings, the transcripts, documentation from businesses, and field notes have been retained, and are available for the purposes of an audit.

Member checks were conducted with industry practitioners as well as the academic community as follows:

- During the evidence collection phase, informants were provided with summarised notes of the salient aspects of the interviews on which to comment. This feedback improved the quality of the interview evidence.
- I also presented research-in-progress papers at four academic, peer-reviewed conferences as well as at university seminars.[7] Additionally, three journal articles were published at appropriate junctures of the research.

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[6] Refer to Figure 4.1 in Chapter Four for an overview of the different sources of the evidence, and how they relate to one another.

[7] I presented seminars at three universities, viz., Trinity College, Dublin; Queen's University, Belfast; and University of Erlangen, Nuremburg. Four conference papers were presented at SAICSIT 2003 (Johannesburg); ISOneWorld 2004 (Las Vegas); SAICSIT 2004 (Stellenbosch); ECITE 2004 (Amsterdam).

- During the final confirmatory phase of the research, I conducted 14 interviews during which the value of the findings to the practitioner and academic community were discussed.

The foregoing is indicative of the diverse strategies that were employed to enhance the credibility of the research, not just at the closing stage but also while the research was in progress. The feedback that I received from the research community has been invaluable insofar as it has helped me improve my understanding of the findings.

6.4.2 Research transferability

In qualitative research, the reader makes judgements about transferability of the findings. This is made possible by reporting the findings with sufficient detail by using *"thick descriptions"* (Lewis & Ritchie, 2003:268).

The higher order narrative in Chapter Five meets the requirements for the thick description that is required. The discussion of ECIS success is immersed within the evidence that was collected. The narrative is supported throughout by excerpts from the interviews to reinforce the discussion. This provides a basis for the findings to have some degree of transferability.

6.4.3 Dependability of the research: an audit trail

The research audit trail is a concept which has been borrowed from the Accounting and Auditing professions where it is required in order to be able to validate values which have been entered in the organisation's books of account. The audit trail is designed to allow for an inspection of how the values in the final accounts were originally entered into the accounting system. The audit trail should also show who authorised expenditure as well as who generated income.

In the research world, there are two possible types of audit trails, viz., an intellectual and a physical audit trail. An intellectual audit trail indicates how the research unfolded, starting with the researcher's original interest to the final assertion that something of value has been added to the body of knowledge. Figure 6.3 presents an intellectual audit trail which represents the evolution of my thinking regarding research over the past five years.

Figure 6.3/...

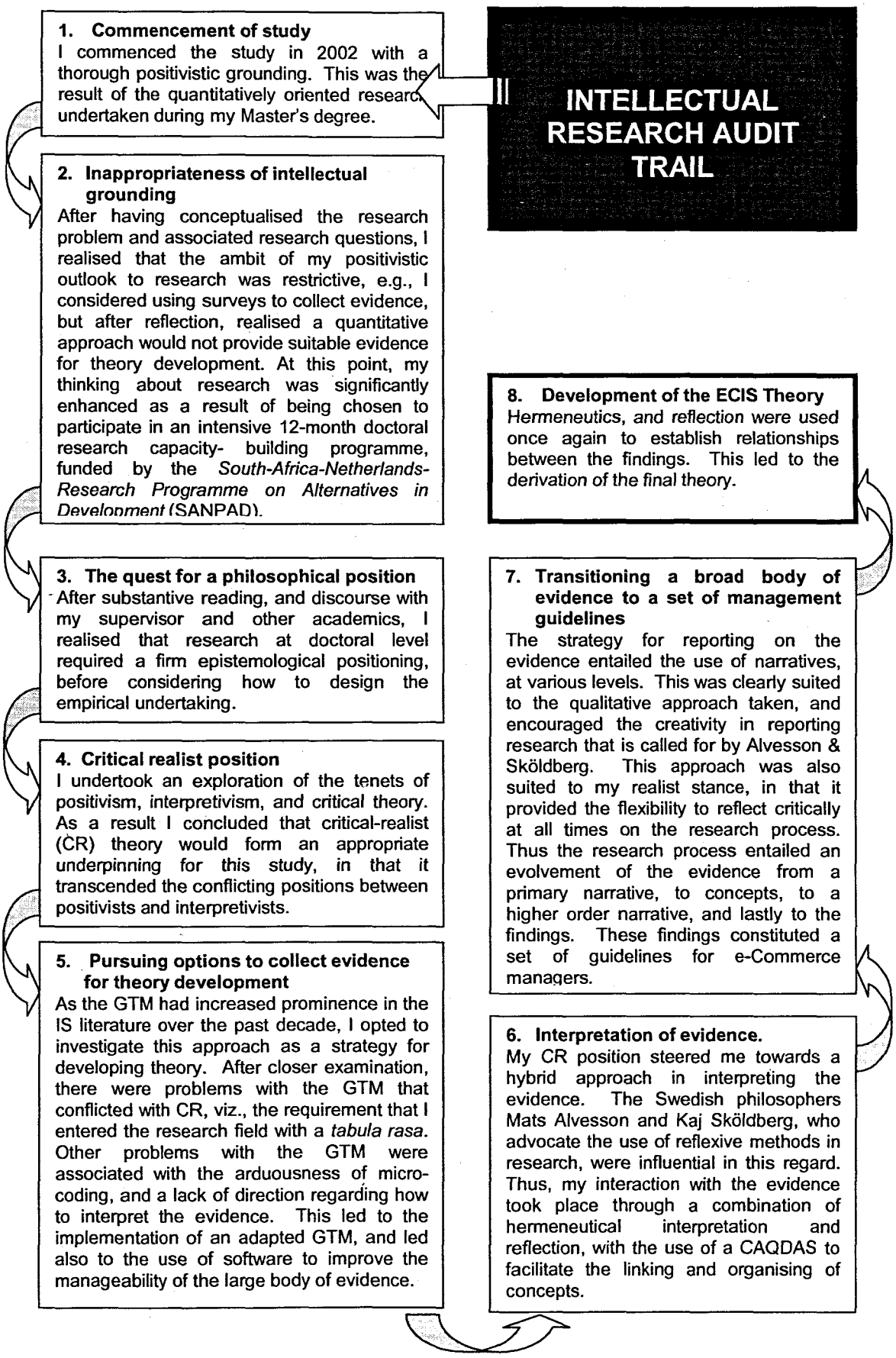

Figure 6.3: The intellectual audit trail

A physical audit trail on the other hand traces the key stages of the study from inception to the final theory. It shows the key decisions related to the research methods. A physical audit trail for this study is presented in Figure 6.4 on the following page.

In general, both audit trails demonstrate that the research has been conducted within a logical and coherent framework, and as such enhances the dependability of the findings.

Figure 6.4/...

PHYSICAL RESEARCH AUDIT TRAIL

1. Identification of problem in the e-Commerce environment

My interest in e-Commerce was as a result of interaction with industry stakeholders. After a preliminary literature review in 2002, potential research questions were explored with e-Commerce managers during a knowledge café and a focus group session. This two-pronged engagement brought the following problem to the fore:

Even though e-Commerce is considered to be an important business issue in the new South African economy, managers did not have a thorough understanding of how ECIS could be effectively managed to successfully conduct e-Commerce. Furthermore, there was limited empirical evidence in the literature to assist the business community to develop a coherent understanding of ECIS success.

2. The research proposal

Based on the preliminary work undertaken above, a research proposal was developed and submitted for consideration to the Higher Degrees Committee of the University. After effecting changes recommended by the committee, the study was registered in 2003.

3. Finalisation of the research questions.

The following research questions were finalised, after 8 interviews with knowledgeable informants.

In e-Commerce environments:

1. How does ECIS contribute to successful business?
2. What are the drivers of ECIS success and how do they relate to one another?
3. What are the important management issues that affect the success of ECIS?

4. Review of literature

A thorough review was conducted of the extant literature, covering both e-Commerce and pre- e-Commerce studies on IS success. The review established that the body of knowledge was fragmented, and that no suitable IS Success theories were to be found. This led to an important decision, viz, that the research questions would be best answered by inductively deriving an ECIS Success Theory from empirical evidence.

5. Interview schedule

Readings from the literature, as well as issues identified during exploratory fieldwork, led to the formulation of the interview schedule.

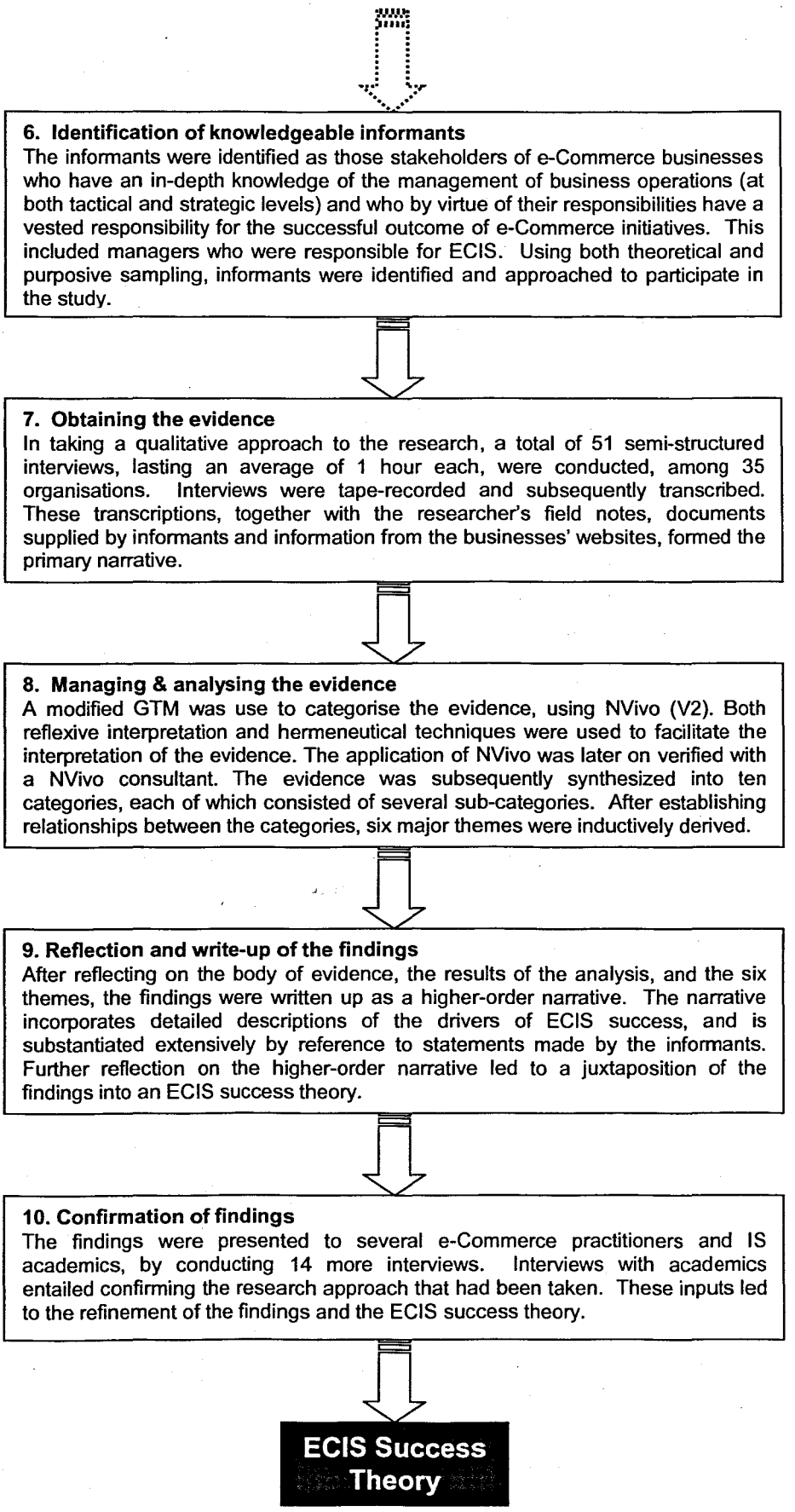

Figure 6.4: A physical audit trail

6.5 Limitations

Having now reflected on the research undertaken over the past five years, a number of limitations have come to mind. Some of these have been identified only at the conclusion of this study as a consequence of the extensive experience that I have gained in the application of research methods. While I was aware of other limitations, such as that of time constraints during the course of the study, many were due to factors beyond my control.

6.5.1 Collection of evidence

I experienced several difficulties in identifying and accessing suitably knowledgeable informants. While both time and financial constraints were a factor in this regard, another challenge was that several informants whom I approached were not able to offer their time for interviews. Furthermore, gaining access to an organisation in itself did not imply that I could make contact with appropriate informants. There were several managers who referred me to less senior staff members of their organisations. At times this proved to be less than ideal as I really would have benefited more from evidence from informants who had a higher-level overview of the e-Commerce issues in their organisation.

I also preferred to collect evidence from more than one stakeholder per business. This, however, was not always possible, and I had to rely for the purpose of triangulation on other evidence such as the website or other published material to corroborate their evidence.

The absence of a South African directory of e-Commerce businesses was also a limitation. In the main I had to rely on media reports and private industry-based research to identify important e-Commerce role-players. Although the methods of theoretical and selective selection that were used are accepted techniques for scientific research, I am of

the view that I would have been able to reach a point of theoretical saturation in the research more quickly if I had had a clearer well-defined list of businesses to work from.

6.5.2 Volatility of the e-Commerce environment

The South African e-Commerce market has been volatile, especially over the last five years in terms of e-Commerce thinking and practice. Many new ideas have been attempted, and as mentioned in Chapter One, quite a number of organisations have failed. But contrary to perceptions in some quarters that South Africa is far away from innovative business practices, this is not the case. For example, South African banks are regarded as world leaders in e-Banking.

Thus I had difficulty in keeping up with the changing business environment, which affected the continuity of the development of my ideas. For example, I had negotiated with the CEO of one company to make a repeat visit, as there were several important issues which required follow-up. At this point I had already analysed the evidence that I had collected during my initial visit to this business. I required further evidence to improve my understanding of ECIS management in that environment. However, in the three months that it took to secure an appointment, the company had restructured its IS department and had implemented new database and order processing technologies.

The dynamic nature of the e-Commerce business environment was also evident in the literature. As such it was a challenge to keep abreast with the proliferation of literature on this topic. Furthermore, the subject of e-Commerce has been studied in various disciplines. Thus the problem was exacerbated, as I had to follow developments from more than one stream of literature.

6.5.3 Resource and time constraints

Being a fulltime member of faculty, the free flow of idea generation, creativity and reflective thinking were constantly interrupted by my commitments to the university. The difficulties posed by time constraints also impacted on my ability to synchronise my fulltime work schedules with those of the informants. This was especially challenging when I travelled away from my base in Cape Town to other major South African centres.

During the course of this study, I was fortunate to have presented my research at four conferences and at seminars that I led at three universities overseas. However, I would have liked the opportunity to share the findings, as they were being developed, with a wider audience. However, opportunities for colloquia and conferences are limited in South Africa, and travel to Europe and North America is costly,

6.6 Future research

The phenomenon which we call e-Commerce is no more than a decade and a half old. During this period it appeared to rocket to success, and then plummeted as the e-Bubble burst. The current renewed wave of e-Commerce initiatives is more sober. As a result the business community is looking to academe for a new understanding of how e-Commerce investments should be managed and evaluated. My work comprises one of many small steps which have been taken in this regard over recent years, and its outcomes could provide the basis for future work in several areas of IS research.

It is standard practice in the scientific community to subject research findings to further exploration, testing and verification. The ECIS Success Theory presented in this chapter was verified through a small sample of informants through in-depth interviews. An immediate avenue

for future research could therefore entail conducting further interviews with a larger sample of informants so as to affirm or extend the theoretical conjecture. Such a study could even be conducted in other geographical regions, as well as in other e-Commerce domains such as B2B, and B2G to determine the transferability of the findings to other research settings. Alternatively the research findings could be translated to a series of formal statements and included in a questionnaire. This would facilitate a survey of a larger subset of the e-Commerce practitioner community. The quantitative data generated from such a survey could, through statistical analysis, be used to verify and refine the current findings.

The next avenue for future research arises from the key finding dealing with CC. This finding has highlighted the importance of back-end ECIS in supporting the attainment of customer-centric e-Commerce. This implies attaining a high level of customer satisfaction and e-service quality. The finding provides an appropriate framework to investigate, in further depth, specific criteria by which customer-centric ECIS should be evaluated. In so doing current research into service quality conducted within the marketing literature (e.g., Zeithaml *et al.*, 2002; Parasuraman *et al.,* 2005) could be extended to take into account the impact of all elements of ECIS infrastructure.

The second finding concerning harmonisation of business and IS mindsets also poses avenues for further research. The current literature has established that the relationship between IS providers and their business clients is an important indicator of IS success. This finding offers a basis to extend research in this area by specifically investigating harmonisation. To date researchers have focused only on the clients' perceptions of the service provided by the IS function (e.g., Pitt *et al.*, 1997; Watson *et al.*, 1998) without regard to the impacts of harmonisation on these perceptions. Thus there is potential to merge existing research in IS-Business alignment (e.g., Luftman, 2003;

Coughlan *et al.*, 2005) with that of the evaluation of IS success. Furthermore, in South Africa, a number of e-Commerce businesses that participated in this study used outsourced IS providers. This outsourced relationship, in particular, also requires investigation, as the dynamics involved in this situation are different from those of the in-house IS-business relationship. This finding therefore presents an opportunity to identify ways to improve the synergies between these two parties.

The finding dealing with the agility of the IS function is a third area for future work. This offers an opportunity to consolidate IS research which has primarily dealt with "flexibility" of IS (e.g., Shi & Daniels, 2003). The current literature has tended to focus on this problem from narrower perspectives such as user involvement in IS planning (e.g., Palanisamy, 2005) and technologies to support supply chain agility (e.g., White *et al.*, 2005). This finding extends current thinking by bringing to the fore the importance of organisational structuring and decision-making processes.

The findings as a whole challenge the application of the oft-cited IS Success Model (DeLone & McLean, 1992). Although the authors claim that their updated model is "*a useful model for developing comprehensive e-Commerce success measures*" (DeLone & McLean, 2003:27), in their attempt to demonstrate this (DeLone & McLean, 2004), only website-aligned success metrics are identified. The model therefore does not take into account (i) the impact of particular IS management practices on IS Success; and (ii) metrics to evaluate backend IS. Thus, a further avenue for future research would entail extending and possibly re-specifying the IS Success Model for the e-commerce environment through further exploration of the findings of this study.

Finally, the current wave of e-Commerce, referred to as Web 2, requires investigation in the light of the findings on ECIS success. The term Web 2 is currently used to describe Web applications that are more personally

oriented to the Web user than were previously offered. This is clearly associated with the finding on CC. Thus research needs to be conducted into the technologies being used by Web 2, to establish how they would support CC, as discussed in this study. Furthermore, as far as I am aware, the term ECIS has not been used in any previous study. Thus in the context of Web 2, the concept requires further exploration and possible extensions to it, so that it becomes more representative of Web 2 technologies.

6.7 Concluding remarks

This research was conducted over a five-year period. In this time I have engaged in a discourse with industry practitioners as well as academics, and I have also read a substantial body of research literature. The ECIS Success Theory that I developed is a product of all of these interactions. While I have worked towards producing a theory, I acknowledge that it is not possible to encompass all the issues and all the relationships in the domain of ECIS Success.[8] This point has been made by several philosophers of science, including Feyerabend (1993:39), who maintains:

> *"We may start by pointing out that no single theory ever agrees with all the known facts in its domain. And the trouble is not created by rumours, or by the results of sloppy procedures. It is by experiment and measurement of the highest precision and reliability."*

I do not suggest that my findings are the only answers to the research questions that I set out to answer. There could be alternative views upon which ECIS success is based. This is a matter for further research

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[8] For example, the perceptions of web-site users (or customers) are an important factor in determining ECIS success. However, as pointed out in Section 2.16 this issue is already well documented in the literature. As such this study has contributed to the gap in the literature by focusing on ECIS management issues within the e-Commerce organisation.

to develop, extend, or disprove the theory presented here. However, within the context of the reliability of the research approach, and the exercise in verifying and confirming the research outcomes, I can conclude that what I have presented are competent and useful answers to the research questions at this point in time.

Thus this particular journey of intellectual pursuit ends. It has been an invigorating exercise and I am consciously aware of the renaissance that has taken place deep within my intellectual being. There is no absolute truth and as researchers all we can do is strive to produce theory which can make some difference to the understanding of members of our community. As Babbie and Mouton (2001:8) point out,

> *"There is no such thing as an instant verification of a hypothesis or a theory. Even when a scientific community accepts certain points of view, hypotheses or theories, as valid and plausible, the acceptance is based on the best available evidence at a given point in time ... If we were to accept a particular point of view as 'certain' or 'infallible' we are in fact saying that no amount of new evidence can ever lead us to change our belief. Such a view is not only obviously false, but clearly makes a mockery of the whole scientific enterprise. The commitment to true and valid knowledge is, therefore, not a search for infallible and absolute knowledge."*

This study needs to be seen in this light, i.e., as an ongoing search for an understanding of ECIS success. I am aware that this work does not end here, but is merely a platform for further inquiry. Checkland articulated this appropriately when he said:

> *"Obviously the work is not finished, and can never be finished. There are no absolute positions to be reached in the attempt by men to understand the world in which they find themselves: new experience may in the future refute present conjectures. So the work itself must be regarded as an on-going system of a particular kind: a learning system which will continue to develop ideas, to test them out in practice, and to learn from the experience gained"*
> (Checkland,1986: xii).

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APPENDICES

APPENDIX A
Example of an email request for an interview

REQUEST FOR AN INTERVIEW - RESEARCH PROJECT

Dear xxxxxx

As per our conversation just now, I would like to confirm my request to meet with you for an interview regarding a research project.

Some brief background:
The project is titled **"e-Commerce Information Systems Success".** The project is jointly funded by the National Research Foundation (NRF) and the Cape Peninsula University of Technology.

Currently the project is in a phase where I am interviewing various stakeholders (business managers; managing directors, marketing directors, e-Business managers, systems/business analysts, project managers or developers) who are (or have been involved) in either the development of e-Commerce projects or the management of businesses that have adopted an e-Commerce business model.

The purpose of the interview will be to elicit from you, your views regarding how successful (or effective) e-Commerce should be managed - within the context of your personal experience.

A brief overview of the project is attached. Please do not hesitate to contact me if you have any queries whatsoever.

Mail: pathers@cput.ac.za
Tel. (021) 469 1032
084 66 55 55 6 (cell)

Please note that all interviews are conducted with the highest level of confidence, and no information in the research report will be directly attributed to either you or your company.

Possible dates to meet:
I am away for the whole of next week;
I am available on December 5th or 6th.
I am in Jhb from the 07th to 09th;
I am available from Dec 12th to 20th.

P.S. You also referred me to XXXXXXX. Please remember to mail me the contact details.

I look forward to meeting you.

Regards & best wishes
Shaun Pather

Cape Peninsula
University of Technology

e-Innovation Academy (eIA)
MULTI-DISCIPLINARY APPLIED RESEARCH
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Tel + 27 21 469 1032 / 1000
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Project Title

e-Commerce Information Systems Success.

(A Project Funded by the National Research Foundation – South Africa and the Cape Peninsula University of Technology)

Project Leader Details

Shaun Pather, *Cape Peninsula University of Technology*
Tel. 021 - 464 1307 / 1300 Cell: 084 66 55 55 6
Email: pathers@cput.ac.za

Background

Although the current era of business has surpassed the hype that was associated with e-Commerce in the 1990s, e-Commerce is still relatively immature. There is still much misunderstanding of e-Commerce's potential capability and how it can be effectively employed. In South Africa, e-Commerce adoption is still low, as compared to other countries such as the UK and USA.

The essence of this research project is to help S.A. businesses to be more successful with their e-Commerce investment. The major question of this project centres on how we mange the technology that facilitates e-Commerce.

The problem

Given the high levels of reliance on Information Systems (IS) to deliver on Business strategy in e-Commerce environments, instruments developed to measure IS effectiveness in traditional (Brick & Mortar) environments, are no longer of value to e-Businesses.

There are a multitude of approaches to measuring Information Systems Effectiveness e.g. system usage; information value; value-for-money studies and user satisfaction. Most of these approaches have been formulated for brick & mortar businesses, and not for businesses whose strategies are mainly achieved via electronic channels. Furthermore, all of these measurement strategies are conducted for the benefit of various stakeholders, and for differing purposes. This poses a dilemma for the business manager who needs a consolidated framework to be able to gauge the success of his investment in technology.

There are two central issues to the research problem. Firstly e-Commerce is considered to be an important business issue in the new South African economy. Secondly Information Systems are central to the success of e-Commerce. However this technology is not yet applied in an optimal way. This calls for a better understanding of how Information Systems can be effectively managed. In order to optimise Information Systems managers

of e-Commerce businesses are required to evaluate the success of these systems. They therefore require a comprehensive understanding of the factors that affect ECIS Success.

Aim of study

To determine critical drivers of Information Systems success in e-Commerce environments.

Research Questions

In light of the questions arising around the measurement of e-Commerce effectiveness the key issues that warrant exploration in respect of developing a model for IS evaluation in e-Commerce environments are:

1. How do ECIS contribute to successful business?
2. What are the drivers of ECIS Success and how do they relate to one another?
3. What are the important management issues that affect the success of ECIS?

==========

end of project overview.

Interview Schedule

Introductory remarks:

Given current trends many businesses are investing time, money and effort into e-Commerce. The essence of this research project is to help S.A. Businesses be more successful with their e-Commerce investment. The major question of this project centres around how Managers gauge or measure the success of their eCommerce strategies.

Main question (put forward at beginning)

I would like hear your perspectives, as to what you consider as being the important issues with regard to being successful in e-Commerce. Specifically, how do you determine if the Information Systems deployed in this business are effectively serving your business objectives?

Specific questions

i. **What criteria do you have to measure the success of your business?**
ii. **How well has the e-Commerce strategy worked for your organisation?**
iii. **What are the areas of concern/problems?**
iv. **What have been the successes?**
v. **What are the main systems that are being used, and how do you evaluate them?**
vi. **A web-site means many things to many people, but most people agree that is only an interface. Do you agree? What do you think your organisation should be monitoring?**
vii. **What do your customers want? Why do they buy from you?**
viii. **Do you have a business model for your e-Commerce activity? Is it different from any of the other business models you may have?**

==========

Important preliminary information to obtain:

1. Stakeholder issue:

Ascertain clearly, the respondent's position in the company.

Determine the stakeholder interest the respondent has in e-Commerce success.

2. Wrt ICDT model

Within which quadrants of the ICDT model has this company positioned its e-Commerce operations?

Virtual **Information** Space; Virtual **Communication** Space;

Virtual **Distribution** Space Virtual **Transaction** Space

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Fax + 27 21 469 1002

ATT: xxxxx

Dear xxxxx

Evaluating e-Commerce Effectiveness Research Project

On behalf of the Cape Peninsula University of Technology (CPUT), and the e-Innovation Academy, I would like to thank you for the interest shown in our research activities.

We understand that you have limited time, and granting us some of this time, to advance and knowledge creation is much appreciated.

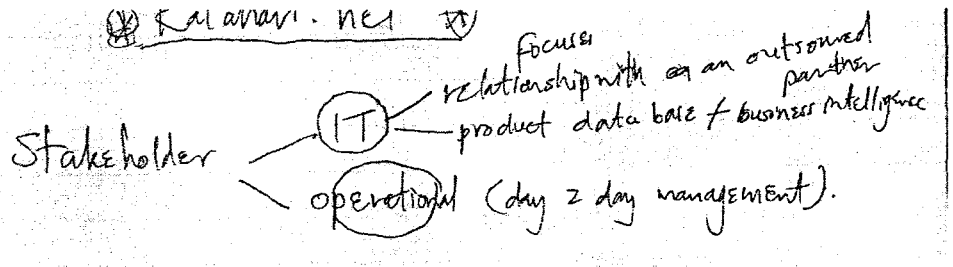
I would like to give you an undertaking, that the information and views that you and/or your company share will be kept confidential, and that this will not be used for commercial gain or purpose in any way whatsoever.

Hoping that we can continue building a good relationship between yourself and the CPUT.

Yours faithfully

.....
Shaun Pather
Tel. +27 (21) 464 1307 / 084 66 55 55 6

AN EXAMPLE OF HANDWRITTEN FIELD NOTES



Rel. bet. IT & business was rock-bottom.
Request from business was "get something on the web".
Distrust between IT & Business.

Wanted to get Business & IT together.

Outsourced IT altogether.
Business takes responsibility for IT.
Offshoring partner takes accountability.

! (Team meeting) → Business prioritizing meeting: prioritizing
1. Being open
2. Turnover
3. Gross Profit

Business involved in everything

New products
Scoping, → Implementation.

IT ~~is~~ now a role-player in brand decision-making.

Every process supported by IT.

(2)

Service + SCM ++

Business is happy - why change? X

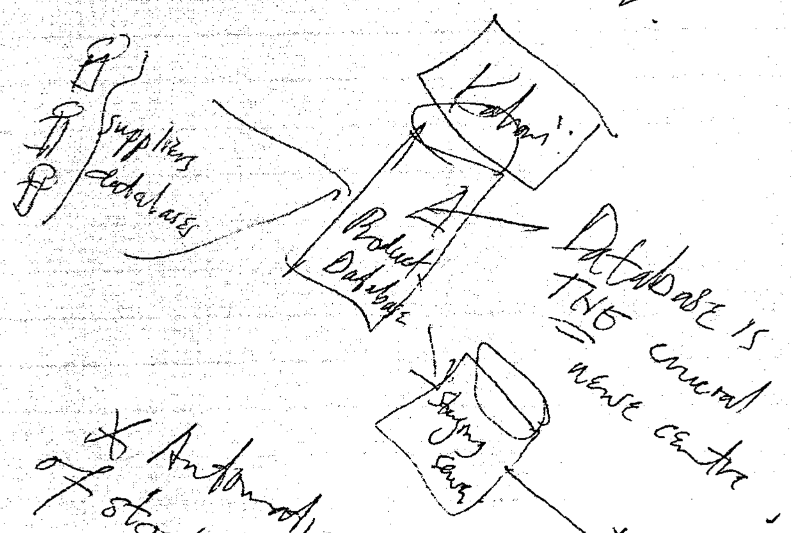
Key Monitoring — 1. Monitoring "Tasks" → Any problem with the web-site.

(2) Back-office system → ordering & fulfillment.

(3) Data – Most important driver of + other monitoring systems.

→ 300-400 databases world-over.

Andre will email slide on data loading issues.



* Automatic updating of stock, prices etc on a daily basis.

③

(✳) Automatic updating causes problems
e.g. Stock field updates "price field"!

3 important tests.

A * GP report: Matches Cost P. against Cost Price → Gross Profit

B * Supplier — Updating of data

C * IT reports — system uptime. (i.e. data being

* Caltest: SMS reports (every 120s. → Bank).

Must always have a picture!

Marketing Issues

* No. of orders per day.
* Recommendation for customers
* Search facilities. → speed, friendlyness....
* Page down-loading = max 8secs.
  → testing all the line (include modem).
* Customer query department (log's complaints)

FIELD NOTES TRANSCRIBED

APPENDIX E: AN EXAMPLE OF FIELD NOTES
Summary Of field notes

Date: xxxxxx
Name of Interviewee: xxxxxx
Position: xxxxxx
Company: xxxxxxx

Most often heard terms: GP, turnover

3 MAIN ISSUES:
a. Outsourced relationship
b. Business Intelligence (BI)
c. Databasing – seen as core to the business success.

History
Relationship between business and IT was "rock-bottom".
Business did not understand the role of IT and the complexities in IT.
Systems were plagued by serious problems such as bugs, enhancements that were required etc.

Initially the attitude of business managers was "Get something going, get it on the web and carry on".
Managers did not have a firm understanding of IT and the role of IT in business.
Resulted in breakdown in communications between IT and business.
"Distrust was huge"

CEO and CIO made a strategic decision to get business and IT "together".
The first tactic was to outsource the IT department **in total**.
Introduced methodologies in IT wherby business takes **RESPONSIBILITY for IT**, and IT partner takes **ACCOUNTABILITY**.

Prioritising of tasks were done on an ad-hoc basis - Whichever business manager "shouted the loudest" was able to have his/her tasks prioritised.

Current operations
(Follow Up question: When you say "IT" is involved – who exactly is IT – what are their portfolios or role-functions?)

Institutionalised a business prioritising meeting. A team of business stakeholders meets weekly with IT managers– and does short term (weekly) and medium term (30-90 day) prioritising. Criteria that guide prioritising are

linked to business rules e.g. tasks that directly affect keeping the business over are at the top of the list, followed by tasks that directly affect turnover, and gross profit etc.
RUP methodologies, incremental development – within six weeks a change noticed. Business fully involved in all phases of the life-cycle. There are business teams for scooping, specifications, testing etc.
The result of these team meetings resulted in mutual understanding between departmental managers of each others needs. All role-players were now understanding when their own departmental needs were moved down the priority list.
IT role-players began to understand what was in business managers minds, how they thought about business, and what they were thinking about.

IT Role players
IT role players are involved beyond the traditional role – they are consulted at every level of business decision making - IT role-players are not just involved in when business needs IT tasks – rather they are involved in all levels of decision making – including deciding on business expansions, GP, budget, turnover issues.

Value Added Chain
A value-added chain is in place. This helps to identify redundant systems. Furthermore all processes not linked to this chain (and consequently to turnover and GP) are canned. Furthermore every single business processes must be supported by IS – including service, logistics, supply chain management.

Maintaining the happy marriage between IT and business needs a lot of work.

Indicators of system problems:
- Over-time hours start creeping up –
- Monitoring logged in tasks versus rate of completion of tasks.

Back office systems
Kalahari Management System (KMS) is in place.
Total ordering and fulfilment processing handled by KMS –
Everything starts with the data. IF data goes down the tube – so will the site!

Andre supposed to email me slide of data loading issues.

Databases all over the world
300-400 databases. Ranging from 2million down to 2 products.
Primary database houses all product info.
Suppliers are totally responsible for providing the data to the primary databases. Suppliers upload their data before 12 midnight – this is subjected to the staging process, and by 6am the data is available via the site.

A second database – the staging server – stock and price files received when stock and price changes.

This data run against the primary databases – only if stock is available then the primary databases is updated. This data is then made available via the site (uploaded in the early hours of the morning. Therefore at any one time Kalahari is at least 12-24 hours behind the world in terms of having updated stock.
Not possible to go through every single price item. So exception reporting takes place to identify errors e.g. selling price is lower that the cost price.

GP report used to manage the changing data.
Suppliers report – check how many suppliers have actually sent through an updated data file + at what time did the report come through, how long did it take to upload.

Payment system
Cal test used to check payment system every 2 minutes – and message sent via SMS or email.

ON the site

- **Search facilities on the site -**
  - continuously tested.
  - Marketing dept. interested in what people are searching for.
  - Queries form customers regarding searches are monitored.
  -
- **Downloading time**
  - 8 secs max.
  - Testing via dial-up.
- **Merchandising**
  - Quick turn around on updating stock items – IT must be able to support updating of products – try to achieve updating within 10 minutes.

Communication with customers
Direct marketing using email.
However by the time email is sent out – stock on special is sold.
Monitor how many emails are sent out.

Kalahari Management System (KMS)
Essentially a CRM system.
Twice a day orders for suppliers are compiled. Mostly electronic – but some manual – dependent on whether the supplier has electronic facility.
The pipeline – all orders, in process, on pick-list – i.e. everything besides already fulfilled orders – **crucially impt. part of the data – This is processed and is available as a report each morning - the information from this report gets priority every morning. IS then transmitted to Customers services department – out of this there is communication to customers informing them of delivery taking place as normal – or**

otherwise if problems are in the report. Also information is transmitted to warehouse informing of delivery problems.

Suppliers and couriers have deadlines and must adhere to agreed SLAs– e.g. overseas suppliers have an hour after receiving a FTP file to report on fulfilment problems – thereafter they have up to 24 hours to have products transported to courier overseas.
Within 2 days arrival in airport – then shipping agent at airport has 1 day to clear through customs, and then get to distribution centre. At distribution centre **processes are streamlined – if it is the only product does not go into a picking & packing system – it is immediately into the packaging system and goes out into the same day.**

KMS also monitors everything – including returns damaged goods complaint etc.

Transactional data is also crucial – this reflects in bank statements.

KMS (Actually a sophisticated CRM system) is also the vehicle used to communicate with the customer –

There is no room for error throughout the picking at packing system e.g. cannot take a chance in sending wrong item to a customer like a adult movie going to a church minister.

Payment gateway is crucial – 2 secs feedback on verification of card, as well as authorisation of payment.

Business Intelligence System

BI feeds business. All business decisions are made based on this.

Issues are:
Detailed turnover analysis report everyday. Turnover per product category – management views summarised report each day.
Product managers get detailed product reports – including any time of the day.
This report assists in monitoring feedback on marketing campaigns – e.g. product manager monitors sales after a marketing campaign is launched ; or after an email blitz.
Customer profiling also done – e.g. to identify provinces with poor sales – to target marketing campaigns regionally.
Gross profit is also monitored – managers watch overall gross profit – then make decisions wrt what action to take to being GP back on par within established Kalahari standard.

Information from BIS used for both strategic as well as day to day planning. BI is IT responsibility with a manager assigned to the BI system reporting to CIO.

CLEAR Quest – IT management tool.

All users in company have access to Clear quest – and log problems – with a priority code.

IT managers deal with Clear Quest logs all day – dealing with priority issues on the turn – very urgent tasks even may mean that IT personnel have to drop other tasks to attend to urgent task.

Medium priorities are discussed at beginning of each week.

Three legs on which they work:
Opps & Support – anything that takes less < 1hr to fix goes into this pool.
Enhancement & major bugs – all tasks > 1 hr and less than a week
Ad-hoc projects – tasks that need more than a week.

ALL HIGH PRIORITY FAULTS LOGGED ARE FIXED IMMEDIATELY, OTHERS GET PRIORITIES AT THE BUSINESS PLANNING TASK TEM MEETING ON A WEEKLY BASES.

Human Error: All BP are tied up with IT – and when users omit to follow procedure e.g. log in new stock, then the only way to pick up a problem - in this case irreconcilable financial data – is through Human intervention and astute analysis.

***IS used for logistics for ordering products – works on* FTP, email, and Fax. Very difficult to manage.** Have built in an "alrm" system to warn. However Kalahari knows that it cannot rely on IT for critical processes eg. Stock ordering – so to MAKE DOUBLE SURE THAT A SUPPLIER HAS RECEIVED AN ORDER, THEY WILL PHONE OR FAX THE SUPPLIER TO VERIFY THAT AN ORDER IS RECEIVED.

Software development – RUP procedures

==========

BUSINESS ISSUES

- Shop is open – outside modem testing site all the time.
- Criteria for performance is met
- 12 secs to download a page
- Searching facility -If you search you can find it.
- You can pay easily and quickly
- Less clicks
- Capability to quickly amend site – add & delete sites.
- Turnover- GP relationship.
- Data loading process.
- Agility to respond to reps offering new products or existing suppliers offering a special.
- Recommendation engine – business uses this to analyse sales, and to identify products to offer on special (hot sell).

- **Pre-orders – e.g. new books, DVDs etc are available on pre-order allows you benefit to know what stock to order.**
- Marketing dept. uses BI on a daily basis. for intelligence.
- **Customer service is crucial** – any system that affects customer service is
- **Hot site**
- **Payment options must work properly – e.g. cancellations when purchases through bank deposits and then the money is not deposited within 5 days.**
- Rely on 3rd parties for reporting accurately when payments cannot be made.
- Telecommunications systems for call centre– have a system to manage all telephony – this is linked to KMS system. E.g. will log a message if an operator is logged of for more than 5 minutes.

Business Model
Key elements of an online business model
No difference between online and traditional business model.

However what is different between B&M is a **collection** model – they collect products and customer go to them to collect it.
But e-Commerce business is a **delivery** model – customer don't collect but they receive.
E-Commerce is a **direct marketing** business. All direct marketing principles are applicable.
B&M use **distribution marketing.**
Demand on **speed** in e-Commerce environment is much greater – customers are not tolerant if products are not available as opposed to B&M.
Packaging in e-Commerce is crucial – processes re different – not the principle of packaging.
Database is a major difference. E.g. Pick N Pay is not as concerned about customer database as the e-Commerce e.g. correct delivery address, email address, correct product. **No margin for error.**
Relationship with suppliers – and suppliers are beginning to realise the importance of accurate data.

SCHEDULE OF INTERVIEWS

	DATE	INFORMANT (PSEUDONYM)	POSITION IN COMPANY	Stakeholder Grp	SIZE OF COMPANY	Type of Company
		PHASE 1: EXPLORATARY PHASE				
1	20-Mar-03	Ludick F.	Manager	IT	small	mobile commerce technologies developer
2	20-May-03	Hindle G.	IT Manager	IT	Large	Clothing and Household retailer
3	20-May-03	Poulter D.	Business Analyst	Bus		Clothing and Household retailer
4	29-May-03	Taljaard C.	Manager	Bus	Medium	online banking
5	05-Jun-03	Mostert S.	Director	Bus/IT	Medium	software developer - health industry
6	12-Jun-03	Ormandy P.	Director	IT	small	software development company
7	05-Aug-03	Ridley M.	Managing Architect	IT	Large	Insurance and Financial Services
8	16-Nov-03	Pillay K.	Manager - IT Projects Prioritization	Bus	Large	Telecommunications services
		PHASE 2: COLLECTION OF SUBSTANTIVE EVIDENCE				
9	06-Apr-04	Niewoudt S.	Director	Bus	small	Conference facilitation
10	23-Apr-04	McLoughlin R.	IT Manager	IT	Large	Vehicle Retailer
11	26-Apr-04	De Goede A.	Chief Operations Officer	Bus/IT	Medium	Online Retailer - books, dvds, games etc.
12	29-Apr-04	Hector, O.	Information Systems Auditor	IT	N/A	business consultants
13	03-May-06	De Goede A.	Chief Operations Officer	Bus/IT	Medium	Online Retailer - books, dvds, games etc.
14	23-Jun-04	De Goede A.	Chief Operations Officer	Bus/IT	Medium	Online Retailer - books, dvds, games etc.
15	24-Jul-04	Vennard, R.	Group Marketing Director	Bus	Large	Grocery retailer
16	01-Jul-04	Marshall, G.	e-Business Consultant	IT	N/A	business consultants
17	02-Jul-04	Averbuch, U.	IT Manager, System Analyst	IT	Large	Public Sector
18	03-Jul-04	Mkefa, R.	B2B Consultant	IT	N/A	Consultant
19	07-Jul-04	Mitchell, L.	IT Consultant	IT	N/A	Consultant
20	08-Jul-04	McGregor, P	Managing Director	Bus/IT	small	Online retailer + web developer

SCHEDULE OF INTERVIEWS

	DATE	INFORMANT (PSEUDONYM)	POSITION IN COMPANY	Stakeholder Grp	SIZE OF COMPANY	Type of Company
21	27-Aug-04	Du Toit, S.	Software Architect	IT	Medium	Online Retailer - books, dvds, games etc.
22	22-Oct-04	Pothier, P.	Business Manager	Bus	small	Online Retailer - books, dvds, games etc.
23	22-Oct-04	Swanepoel, N.	IT Manager	IT	small	Online Retailer - books, dvds, games etc.
24	27-Oct-04	Paulse, F.	CEO	Bus	small	Online Retailer - wine
25	28-Oct-04	Kamaldien, L.	Director	Bus	small	Online retailer - cameras
26	28-Oct-04	Harris, J.	Director	Bus	small	Online retailer - cameras
27	28-Oct-04	Martin, F.	Director	IT	small	Online retailer - cameras
28	14-Dec-04	Van Der Merwe, S.	e-Business Marketing Executive	Bus	Large	Online airline
29	14-Dec-04	Cruywagen, S.	Marketing & Sales Executive Manager	Bus	Large	Online airline
30	14-Dec-04	Poswa, S.	Marketing Manager	Bus	Large	National paint manufacturer
31	15-Dec-04	Schreider, C	Executive IT Manager	IT	Large	Online airline
32	15-Dec-04	Mkapheni, A.	Managing Director	IT	small	Online travel
33	05-Jan-05	Randy, R.	Manager	Bus	small	Specialist camera retailer
34	07-Jan-05	Edward, J.	Director	Bus	small	Shipping
35	07-Jan-05	Pumela, S.	Director	Bus	small	Children's outdoor equipment retailer
36	09-Mar-05	Harris, G.	Commercial Manager (incl. Marketing)	Bus	Medium	Online Retailer - books, dvds, games etc.
37	11-Mar-05	Oosthuizen, C.	Chief Database Architect	IT	Medium	Online Retailer - books, dvds, games etc.
38	08-Nov-05	Dasie, M.	Commercial Director	Bus	Large	National Movie theatres & Movie distributor
39	08-Nov-05	Scheepers, S.	Marketing Executive	Bus	Large	National Movie theatres & Movie distributor
40	08-Nov-05	Azeem, C.	e-Commerce Manager	Bus	Medium	Books online
41	11-Nov-05	Martin, A.	CEO	Bus	Medium	Hotel and Leisure resort
42	11-Nov-05	Pike, D.	Managing Director	Bus	small	Online retailer - cameras & accessories

SCHEDULE OF INTERVIEWS

	DATE	INFORMANT (PSEUDONYM)	POSITION IN COMPANY	Stakeholder Grp	SIZE OF COMPANY	Type of Company
43	15-Nov-05	Ziqu, C.	Director & Software Developer	IT	small	Web-based software developer
44	18-Nov-05	Wannenburg, T.	Managing Director	Bus	small	Online retailer - children accessories
45	23-Nov-05	Ziervogel, A.	Director & Software Developer	IT	small	Web-based software developer
46	08-Dec-05	Bothma, R.	Managing Director	Bus	Medium	Online retailer - flowers & gifts
47	08-Dec-05	Mjekula, E.	IT Manager	IT	Large	National Movie theatres & Movie distributor
48	09-Dec-05	Meyer, W.	General Manager	Bus/IT	Medium	Online retailer - electronic equipment, games e
49	09-Dec-05	Rutter, F.	Home Shopping Manager	Bus	Large	National grocery retalier
50	09-Dec-05	Chiles, M.	CRM Executive	Bus	Large	National wohlesaler - general m erchandise
51	12-May-05	Schreider, C	Executive IT Manager	IT	Large	Online airline
		PHASE 3: CONFIRMATION AND VERIFICATION OF FINDINGS				
52	15-Mar-06	Andy Bytheway	IS Professor	Academic	N/A	
53	23-Aug-06	Andy Bytheway	IS Professor	Academic	N/A	
54	04-Sep-06	Azeem, C.	e-Commerce Manager	Bus	Medium	
55	13-Sep-06	Potts, Y.	e-Commerce Manager	Bus/IT	Large	
56	15-Sep-06	Martin, F.	Director	IT	small	
57	18-Sep-06	Harris, G.	CEO	Bus	Medium	
58	18-Sep-06	Poswa, S.	Marketing Manager	Bus	Large	
59	19-Sep-06	Pike, D.	Directorr	Bus	small	
60	20-Sep-06	Elizabeth Henning	Professor & Author Qual. Research	Academic	N/A	
61	27-Sep-06	Frank Bannister	IS Academic	Academic	N/A	
62	29-Sep-06	David Barnes	IS Academic & e-Commerce Research spec	Academic	N/A	
63	29-Sep-06	Matthew Hilton	IS Academic & e-Commerce Research spec	Academic	N/A	

SCHEDULE OF INTERVIEWS

	DATE	INFORMANT (PSEUDONYM)	POSITION IN COMPANY	Stakeholder Grp	SIZE OF COMPANY	Type of Company
64	27-Sep-06	Frank Bannister	IS Academic	Academic	N/A	
65	14-Oct-06	Ziervogel, A.	Director & Software Developer	IT	small	
	NiVivo Consultation					
66	07-Sep-06	Patsy Clarke	Nvivo specialist	Academic	N/A	

EXAMPLE OF MANUAL CODING A TRANSCRIPT

07 G

1 **Title of Project: Measuring e-Commerce Effectiveness**

2

3 **Interview Transcript**

4 * I.T. Perspective

5 **Date:** Main issues

6 **Time:** 1) • Must be customer focused

7 **Venue:** Pinelands, Cape Town 2) • joint business/IT focus is reqd. for success

8 **Company:** 3) • focus on evaluating business not I.T.

9 **Name of Interviewee:** 4) • Focus on how I.S. creates value for • customers.

10

11

12 SP: We are with Matthew Roux at the old Mutual. Matthew just to give you

13 some brief back ground as to what this is about. The Research Project is,

14 the goal for the project is to develop an instrument. A generic instrument,

15 which may be —— to use by various businesses. It may, the idea is, we

16 targeting —— because larger organization like yourselves have been

17 involved in e-commerce activity for much longer we are trying to gather

18 intelligence firstly at this level in a more qualitative way. And one of the

19 problems business people have had is the historical IT Investing issue as

20 well is evaluating how effective how well any IT....that being one of the

21 issues for evaluation. And going back in the past one of the various ways in

22 which IT Investments were evaluated for example—— ——which outline user

23 satisfaction and how they go about evaluating user satisfaction as a function

5) • IT people must understand business strategies

6) • Buy solutions where possible.

7) • Web-site usage stats are not sufficient to measure success

8) • Sophistication of the business affects evaluation

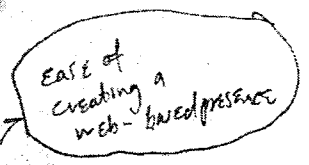
9) • Implement I.T. changes incrementally, rather than a big-bang approach

SP: Yeah. The working definition of e-commerce here is web based and other channels that facilitate and enhance primarily web based services delivery those sort of thing

RM: ——— let's start with... I wanna speak generally and if you pick up something you wanna ....the first obvious observation is that we have many applications, we have different applications at Old Mutual running on our work stations. Not everyone but if you add them up obviously, ok. Traditionally, those have been thick clients, starting with — and the moving towards VB applications and C++ applications. But clearly like the rest of the world we've moved towards the browser in the last 3 to 5 years. So, browser is our majority of our strategy going forward, if we can build it in browser, we'll do that first before we build it in end user client. Now because of that step that implies that we will get browser front for our employees, for our —— and for our clients. Those are the kind of 3 big groups that we need to speak about here. Because in many senses if you are talking about service delivery your topic it's not just the delivery to clients—— employees. I mean we have the sense of —— for our employees and they also have to — not allowing ourselves just to think on — obviously our priority was the stuff that gets the clients are what gets us into the business. So, you can imagine that money will flow more easily to that and start bringing business on our behalf. So, that's our initial scoping and we have transaction systems that go from

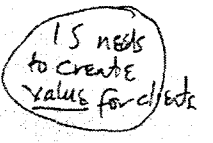
Preference in corporates to build web-based applications

client/customer focused

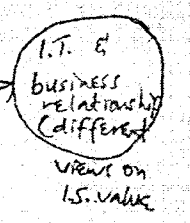


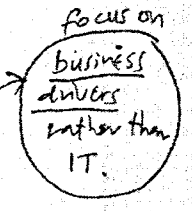
easy to do every line of business has spawned 10 to 20 web sites and those are secure public and which have many intranet of course because every project of course every piece of information suddenly arises in some kind of intranet.

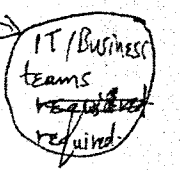
SP: Do all your development happening in house or most of it?

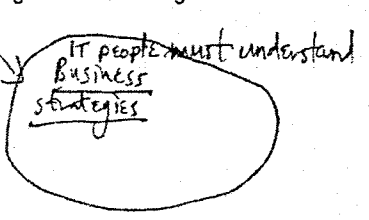


RM: Let me come to that —— and I can say that we have been looking very closely at your question, which is "are we providing service delivery? Is this channel actually adding value to our clients to communities and employees?". At that juncture it's probably interesting to describe organizationally how do we approach this problem because there is IT and there is business. From IT perspective, just on this particular question on "are we providing value?" we are involved in group architecture and I am specifically involved with a couple of my colleagues. And then we have a line of business called Group e-Commerce so we are architects and their job is actually to not really focus on the IT but on the business drivers of the business needs of all those lines of business. Now because I work closely with Group e-Commerce we've got a nice kind of IT/Business Team considering these problems. My role would be to bring them information and architecture Technology layer to what they could be doing so portal we'll talk about portals a little bit later. Is there something that we can change the way we operate? Their job is to constantly is to meet with the Business unit and to understand where they are going with their strategies for e-









Commerce. There is a lot of joins happening between Group e-Commerce and your Group architecture in the sense that we can we are a member on their current project team. Team that is looking at measuring service, efficiency etc and measuring what we are doing with our webs and then as question arise they 'll pop questions and ask us what is this, why are you doing this, so there is a — what's going on right now. I think a nice picture is to say well Group architecture represents all these this line of business in respect of IT, ok, lots of LOB's as I call them, lines of business) Group e-Commerce represents the same lines of business but from a business perspective. So, you've gotta a kind of a —— model that represents — I spent time with 100 people standing in a room discussing these things.

joint teams to measure service

business focus required

SP: Three of the words you used down stairs you said that you tried to make sure that the synergies are happening between all these different divisions and work happening bringing you together.....

RM: And one example of that is that we have a common hosting infrastructure for these web sites. Basically we don't have every man — having their own web server. We've got a set of web servers for these public secure intranet and 96% of our sites are on them. They are lines of business that have their own web servers but the aim is to put them into one. I think we've done very well to get a small environment for hosting all these sites, which is quite good to monitor and secure data. That is an example of the synergy that has been

data security is important

DATA ANALYSIS – CODING OF TRANSCRIPTS

UNIQUE INTERVIEW CODE: G

Name of Company: xxxxxxxx

Date of Interview: 05 August 2003

IT PERSPECTIVE

Main issues

1. Must be customer focused
2. Joint business / IT focus is required for success
3. Focus on evaluating business not IT
4. Focus on how IS creates value for customers
5. IT people must understand business strategies
6. buy solution where possible
7. Web-site usage stats are not sufficient to measure success
8. sophistication of the business affects evaluation
9. implement IT changes incrementally, rather than a big bang approach

Key	Line/s	Data extract	Code
G 1	39	They are one and the same	Evaluating the IS implies evaluating business activity
G2	80-83	But clearly like rest of the world we've moved towards the browser in the last 3 to 5 year. So, browser is our majority of our strategy going forward, if we can build it in browser, we'll do that first before we build it in end-user client. Now because of that.	Preference in corporate to built web-based application
G3	89-90	The stuff that gets the client are	Clients/customers focused
G4	98-100	We probably don't use the word e-commerce anymore, we use e-base application	New term e-based application
G5	112-113	Gee we've been doing all this work but it is adding much value, or do we need to do to continue adding value?	Awareness of the need to evaluate IS

Key	Line/s	Data extract	Code
G6	115-116	Unchecked proliferation of essentially because the web is so easy to do	Lack of IS evaluation and ease of creating a web-base presence
G7	125	Adding value to our clients to communities and employees	IS needs to create values for client
G8	126-127	How do we approach this problem because there is IT and there is business	IT and business relationship (different), views on IS value
G9	130-132	Business called group e-commerce so we are architects and their job is actually not really focus on the IT but on the business drivers of the business needs of all those lines of business.	Focus on business drivers rather that IT
G10	133-134	We've got a nice kind of IT/business team considering	IT business team required
G11	137-139	Job is to constantly to meet with the business unit and to understand where they are going with their strategies for e-commerce	IT people must understand business strategies
G12	141-142	Team that is looking at measuring services, efficiency etc, and measuring what we are doing with our webs	Joint teams to measure service
G13	146-147	Group e-commerce represented the same line of business but from a business perspective	Business focus required
G14	160-161	Which is quite good to monitor and secure data	Data security is important
G15	175-176	We going to go portal, we buy portal. We probably wont build the portal	Buy solution if available
G16	180-181	Don't outsource your core competencies	Don't outsource core competence
G17	206-207	Question is "look at us, what are we doing	Evaluation is important
G18	210	So that's saying "stop the boat" are we doing this right	Importance of evaluation
G19	216-219	Because to try and pull out of current budget for these guys what's e-commerce thing is costing us	Financial quantifies are difficult to determine
G20	225-226	Site implies on going investment because you need to keep it current	Ongoing investment require to keep site current
G21	235-236	There is no tool that we are using here, for measuring this stuff	Measurements tool required

Key	Line/s	Data extract	Code
G22	247-248	We certainly do have a tool for measuring how the sites are being used	Tools for measuring web-site usage are available e.g. net tracker
G23	259-260	Because if you have like 54000 hints that's fine but that does it cost just to provide that web site	IS evaluation goes beyond measuring site usage e.g. hints (Comprehensive evaluation)
G24	266-267	So our clients our employees, how do they feel about using this sites, are they helping them	Customer centric evaluation
G25	311&319	You get the same look and feel so, same look and feel	Standard look and feel required
G26	363-364	Whenever we are asked that question that you are asking which is 'how are we doing" we have to go and audit the environment again	Standard set of measuring required. Standardized measuring criticism required
G27	370	What are the elements of this particular IT service	Identify elements of the IT services
G28	381	Web sites stuff as I said, all the traffic etc	Measure web usage e.g. traffic
G29	382	Costs of that infrastructure	Financial costs cost of infrastructure developments
G30	385	Can't push the button and get the answer	Evaluation is complex
G31	393	Security costs a lot of money	Costs of security
G32	425	Some are more sophisticated that others	Sophistication of business affects evaluation
G33	438-439	That many of our online business aren't really thinking that hard about it	Evaluation is not given priority
G34	444	Level of sophistication	Sophistication affects evaluation
G34	471-472	Don't let IT make decision for business for the business. It must be neither a joint or very strong ion the business	Joint IT/business perspective required
G35	487-488	The answer is not to do it in one go	Implement IT changes incrementally, incremental IT changes required

Key	Line/s	Data extract	Code
G36	489-492	That approach of planting seed and growing out is very different from the 1999 approach, which was plant a tree and see if there is any seed coming out!	Learn through, trail error

AN EXAMPLE OF A TRANSCRIBED INTERVIEW (PARTIAL)

N.B. THE ENTIRE TRANSCRIPT IS NOT INCLUDED AS AN APPENDIX, BUT A PORTION FOR ILLUSTRATIVE PURPOSES.

Date: 08 July 2004

Time: 11.00

Venue: Westville, DURBAN

Company: XXXXXXXX

Name of Interviewee: XXXXXXXXX

Position in company: Managing Director

SP: Okay I am with Penny, managing director of xxxx . I would like hear your perspectives, as to what you consider as being the important issues with regard to being successful in e-Commerce. Specifically, how do you determine if the Information Systems deployed in this business are effectively serving your business objectives? So Penny if we could start a little bit with saying what it is you do and what your role is as well as your background and we can pick it up from there ....

PM: My background is a designer. My original qualification is a graphic designer and I started through advertising so my initial kind of passion was good creativity even with a marketing creative medium

SP: I have seen some of the XXXXX and I said they really have some good designing people

PM: Yes, and I think that the strength of the business is the fact that there was my self as being very creative. The original managing director, XXXXXX who was very financially orientated and XXXXXX who is a technical gadget and a combination of us three put together, the technology supports the marketing methods, and I think that is what makes E-business successful is when you have a merging of not just an IT department model but something that can achieve business objective or a marketing objective using technology so the technology is the invisible tool, its like paper and printing. We have always taken that kind of approach to development. We call ourselves consultants and a lot of companies don't want to pay to have the full service so we will do just the design potion for some people or we will do the full analysis of how successful you are and for some of our bigger clients we will go and do a full ROI for them and build applications that actually allow them to track on a monthly basis how sales are on the web site as well as savings. It depends on what the client requirements are and there is always the cost component coz we basically sell time....well the academic side I have really enjoyed recently because we can do things just because you can but unfortunately business doesn't work like that. My role now is really to manage and grow the business so I am creative at the moment and I am focusing on new business opportunities and marketing the business

SP: Okay, you have some considerable background and experience in various projects and clients e.t.c, before we get to operational, from your perspective what would you consider to be the key elements for success, whatever the type of business it is, or if you want to talk within any specific context that's fine. What are the key elements that you think would enable e-business success? What would you start looking at?

PM: We work with various clients. There are high-risk clients and low risk clients. High-risk clients are those who don't have defined business models. In other words anyone who doesn't have an existing business, they don't have their processes in place and they basically rely on us to develop their business on the Internet. The risk for those individuals is very high. The risk of failure is very high. If you have an existing business model that

works, and you are starting a new medium and you are opening a new revenue opportunity for your business, then your chances for success are far better. The reason I identify it like this is, and I am not saying that they failed, but they cost us lot of money. From a development perspective we pride ourselves in always having a happy client but its very difficult when the person doesn't know what they want upfront, and you got to bring all that IP to the party. They don't generally have their budget and they don't want to pay for the knowledge that you are giving to them. It's a hard relationship we start at. I don't know if that answers your question.

SP: It does. Lets just talk about the business model a little bit. From your experience are there any types of business models you think are more suited or any types of elements of business that appeal more to being on an electronic channel than other types of business?

PM: Are you talking about true e-commerce in terms of selling in a South African environment or are you looking at the international market.

SP: I am focusing on the South African market

PM: I would say it's critical to choose products that you don't have to touch and feel. Things like travel where you never touch or feel travel before, it's a brochure, whether you feel the brochure in your hand or you see it on a website its still a promise or a dream of a wonderful holiday. Where else a ring you want to try it on, a book doesn't make a difference whether you see a picture of the cover or whether you touch the cover, and the other things like CD's obviously those things are going to work. A product that has an existing brand will also sell, so if you were going to sell a ring it will need to be with Sterns or NWJ. If you don't have an existing brand you better have a product that you don't have to touch or feel because you are never going to get it right.

SP: Lets talk a little bit about development and getting people on board, you just talked about some particular categories being your high risk and low risk clients, but what about taking people along the journey until you do something live, get it up hosted. Along that journey is there anything worth thinking about that through the development side impacts on success later on. What are the issues there?

PM: We have a methodology that we use and follow, a development methodology that we develop. It is very similar to the Microsoft methodology. We actually developed it without looking too closely at theirs because their methodology is very focused on application development so there is a much greater focus on testing and we had to simplify it, but we actually built it based on the mistakes we made. We fixed them by putting a system in place. Sort of a five-year learning curve. You make a mistake, you put a system in place to stop that from happening next time. Basically it boils down to prototyping before you start coding and a serious prototyping plays. We call it functional specification prototype and you actually end up using a system before it's built, and really seeing every page, how every screen is going to look, so you actually use the application before you build it and then put expensive resources into the picture to develop it. Obviously after it goes live I think there is an implementation phase or a change management handover phase which is ignored in a lot of places, and I think its quite critical. And then of course it's marketing. I think its all very well building a website and it's all very well getting it live that's the easy part. Its bringing a partner on board who actually can market it and actually does have the expertise. I think that companies don't put enough budget aside for that portion of the budget. They think that it will just sell its self once its out there.

SP: So do you find that people would say that well yes e-pages make this happen for us and then they sit down and relax

PM: A lot of people build websites and as soon as they built it its done now, the job is done. In my experience having built little e-commerce business that is just 50% of the work. The other 50% takes two years and that's the bit that you really have to monitor, maintain and measure and usually takes much more time

SP: What about during initial scoping, how easy or difficult has it been with the types of clients you have had to align the business strategy as closely as possible to the electronic channel

PM: I have not found that as a problem, what I have found a problem sometimes is that people want to do things that I don't believe are going to succeed, and I will tell them and I think that isn't the best sale technique. If you know that something is not going to work its really hard to kind of ....and I think that really is the difficult part. There aren't really that many concepts that do work in E-commerce. I don't think that you are going to make millions through e-commerce and I will go back to what I said. Low risk clients, and I will use an example like Thompson's tours, they have got an existing brand, they have an existing business. They are selling something that is intangible and to market that using another channel makes a lot of sense, especially a direct channel where you can increase your revenue by not paying commission to that channel or by paying commission to a channel by paying someone who will do that marketing for you. So those are the models that are going to work. Are you referring to business models like RUP port business e-commerce model, is that what you are asking, around that area?

SP: Not necessarily, I am just asking from your experience is there anything that you can think of, whether specific type or not it doesn't matter

PM: You mean services, or products or...

SP: Yes, is there anything with business models that you can pick up that contributes to being successful? I mean you are answering the question because you are talking about existing products e.t.c. If you have another perspective that you want to talk about that's fine?

PM: I don't think we are ....Do you define e-commerce as a payment on line or is it broader in terms of an e-brochure..

SP: Well I am working based on one or two existing models regarding, not e-commerce but e-business which essentially brings it down simply to companies are using the double tube channels for one of four things. They are either there just for information purposes or that could get extended in terms of communication, could get extended in terms of transactions, and could get extended to include distribution as well. How that's been I don't think there is anything else that could happen so it doesn't matter for me where that fits in but I am going to get tied in because there is such a multitude of definitions, commas and business but for me anyone of those four things mean electronic business because you may have a need to just have brochure ware because that's achieving particular strategies for you so that's fine...

PM: I think services, organizations, will benefit from the brochure ware and they will benefit from exposing their internal systems to clients to increase the extranet environment where they expose data that helps their clients to understand how their accounts are managed or the processes, that's more than services and I think the retail industry benefits greatly from that you know the spars and the macro. Although e-commerce this far is never going to be where they make their million. Allowing retailers and stores to get faster access to data is very beneficial, and e-business is a great way to save money. A couple of projects that have been done in that area, millions of rands in courier fees have been saved through not

having to print the data and send it out to all. Those types of cost savings when measured can be enormous, but it's a challenge getting a business to measure them

SP: Yes of course.

PM: And on the communication side, I think that digital communication or email, or whatever method, is a viable way but I think that its becoming more termed as Spam because there is just too much of it now. We used a lot of marketing that way and did very well out of it, but I think there are too many mediums design....

SP: Okay, lets shift focus. We have all these issues, what works and what may not work, lets just say that here we are we have decided to set up transactions so people can our rigids. So now we sit back and we have spent a lot of money and we want to start evaluating, is it working, is it successful. A lot of people I think will just try to monitor turnover, which could be meaningful, but there is lots more to begin to understand, so other than just trying to watch how much sales are coming through what else do you look at or analyze because I believe there is various hatches of the entire offering that will contribute eventually to, say if its sales, making more sales, or if it is getting the information across or getting more people aware of whatever it is. Where would you start off? What would you highlight?

PM: In a big budget scenario I would try and tie as closely as possible and build a system that allows me to monitor all of my marketing efforts, which you can do on the web. So always track where the leaks come from, track the process and how people move through the website very carefully, so put good software in place which allows you track sources of where your tracker comes from as well as how people enter the site, what sort of path they take to make a sale, or not make a sale as the case may be or make an enquiry. If they put an enquiry through try and monitor those enquiries and make sure that as the enquiries are

196 coming through those enquiries are answered. People look at page impressions and site
197 usage. I think used correctly those can be very valuable
198
199 SP: I am not sure what products are available to do this but are there products that could
200 analyze this type of data for a manager and give some kind of ...
201
202 PM: I mean there are a lot of products that do this but they give you a lot of data they don't
203 give you any information, and generally you have to extract that and interpret it for people.
204 They can interpret it themselves but its generally hard work and quite a few people do it
205
206 SP: Can you mention one or two packages that do this?
207
208 PM: We use web trend, and there is another one, quite a good one that is a lot cheaper
209 web trend and is actually very good. I can't remember its name, but we have got web trend
210 being set up very nicely and it gives us quite nice data. We expose that to our clients
211 through an extranet so the cost of converting to someone else is not warranted. We also
212 build logging into websites where we actually send hits to pages to assist the database...
213 track which pages they come from and then build graphs for clients specifically around
214 certain areas of the website that they have been very keen on tracking and then produce
215 management reports out of those stats. So it combines these log file trends with log data.
216 SP: What is the typical type of intelligence you are trying to get through analysis of Web
217 trim's data, what are you looking for, can you give me an example. You are producing
218 management reports what I really want to know is what is the typical type of report that you
219 are going to produce. What are the things that.....

Document No.	Stakeholder	Stakeholder: 1=IT ; 2=business; 3=IT/Bus	ICTD	ICTD: NA= 0; I=1; I+C=2; I+C+T=3; I+C+T+D =4	(1) /High Costs	(2) /IS Development	(2 1) /IS Development/Driven by business	(2 2) /IS Development/Methodology	(2 3) /IS Development/Prototyping	(2 4) /IS Development/Easy to create a web-site	(2 5) /IS Development/In-house development	(2 6) /IS Development/Outsourced development	(2 7) /IS Development/Testing	(2 8) /IS Development/build vs buy
						1	2 2 1	2 2	2 3	2 4	2 5	2 6	2 7	
1	Business	2	NA	0	0	0	0	0	0	0	0	0	0	0
2	IT or IS	1	I,C,T and D	4	0	0	0	0	0	0	0	0	0	0
3	Business	2	Info, Comm	3	0	0	0	0	0	0	0	0	0	0
4	IT/IS and Business	3	Info, Comm	3	0	0	0	0	0	0	0	0	0	0
5	IT or IS	1	NA	0	0	0	0	0	1	0	0	0	0	0
6	IT or IS	1	I,C,T and D	4	1	0	1	0	0	3	0	1	0	2
7	Business	2	Info, Comm	3	0	0	1	0	0	0	0	0	0	0
8	Business	2	Information	2	1	0	1	0	0	0	0	3	0	0
9	IT or IS	1	Information	2	1	0	0	0	0	0	0	0	0	0
10	IT/IS and Business	3	I,C,T and D	4	1	0	0	1	0	0	0	1	0	0
11	IT/IS and Business	3	NA	0	0	0	1	0	0	0	0	0	0	0
12	IT or IS	1	Information	2	0	0	0	0	0	0	0	0	0	0
13	IT/IS and Business	3	NA	0	0	0	1	0	0	1	0	0	0	0
14	IT or IS	1	NA	0	0	0	0	0	0	0	0	0	0	0
15	IT/IS and Business	3	NA	0	0	1	0	0	0	0	0	0	0	0
16	Business	2	I,C,T and D	4	4	0	0	0	0	0	0	0	0	0
17	IT/IS and Business	3	NA	0	1	1	0	1	1	1	0	0	0	0
18	IT or IS	1	I,C,T and D	4	0	0	0	4	0	0	0	0	0	0
19	IT/IS and Business	3	I,C,T and D	4	7	2	1	1	0	0	0	0	0	0
20	Business	2	I,C,T and D	4	2	0	0	0	0	0	2	0	0	0
21	IT/IS and Business	3	I,C,T and D	4	0	0	0	0	0	0	0	1	0	0
22	Business	2	I,C,T and D	4	0	0	1	1	0	0	0	0	0	0
23	Business	2	Information	1	0	0	0	0	0	0	0	1	0	0
24	IT or IS	1	I,C,T and D	4	0	0	0	2	0	0	0	0	0	0
25	IT/IS and Business	3	I,C,T and D	4	1	1	0	0	0	0	0	1	0	1
26	Business	2	Information	2	2	0	0	0	0	0	0	1	0	0
27	Business	2	Information	2	3	0	1	0	0	0	0	2	0	0
28	Business	2	I,C,T and D	4	4	0	3	2	0	0	0	0	3	0
29	IT or IS	1	I,C,T and D	4	0	1	0	0	0	0	0	0	1	1
30	Business	2	Information	2	0	0	1	0	0	0	0	4	0	0
31	Business	2	Information	1	0	0	0	0	0	0	0	0	0	0
32	Business	2	I,C,T and D	4	0	0	2	0	0	0	3	2	0	0
33	Business	2	Information	2	0	0	1	0	0	0	0	1	0	0
34	Business	2	I,C,T and D	4	2	0	0	0	0	0	0	1	0	0
35	IT or IS	1	NA	0	1	0	2	0	0	0	0	1	2	0

Document No.	Stakeholder	Stakeholder: 1=IT ; 2=business; 3=IT/Bus	ICTD	ICTD: NA= 0; I=1; I+C=2; I+C+T=3; I+C+T+D =4	(1) /High Costs	(2) /IS Development	(2 1) /IS Development/Driven by business	(2 2) /IS Development/Methodology	(2 3) /IS Development/Prototyping	(2 4) /IS Development/Easy to create a web-site	(2 5) /IS Development/In-house development	(2 6) /IS Development/Outsourced development	(2 7) /IS Development/Testing	(2 8) /IS Development/build vs buy
36	Business	2	Info, Comm	3	3	0	2	0	0	0	0	2	0	0
37	IT or IS	1	NA	0	0	0	0	0	0	0	0	0	1	0
38	Business	2	I,C,T and D	4	0	4	2	0	0	0	0	2	1	3
39	IT or IS	1	Info, Comm	3	0	1	1	0	0	2	0	3	0	0
40	IT/IS and Business	3	I,C,T and D	4	0	0	0	1	0	0	1	0	1	1
41	Business	2	I,C,T and D	4	0	0	4	0	0	0	0	1	0	0
42	Business	2	Information	1	0	0	0	0	0	0	0	0	0	0
43	IT or IS	1	I,C,T and D	4	3	0	0	0	0	0	0	0	0	0
					37	**11**	**26**	**13**	**2**	**7**	**6**	**28**	**9**	**8**

Document No.	Stakeholder	(2 9) /IS Development/IS Planning	(2 9 1) /IS Development/IS Planning/Customer levels of IT literacy	(2 9 2) /IS Development/IS Planning/Document business expectations	(2 9 4) /IS Development/IS Planning/Risk assessment	(2 9 5) /IS Development/IS Planning/System Architecture	(2 9 6) /IS Development/IS Planning/Document business processes	(2 17) /IS Development/Compatibility	(3) /HIGH RELIANCE ON IS	(4) /AGILITY & INNOVATIVENESS	(5) /BUSINESS & IS RELATIONSHIP	(5 1) /BUSINESS & IS RELATIONSHIP/Turn around time	(5 2) /BUSINESS & IS RELATIONSHIP/Service Level Agreements	(5 3) /BUSINESS & IS RELATIONSHIP/Different perspectives
1	Business	0	0	0	0	0	0	0	0	0	0	0	0	0
2	IT or IS	0	0	0	0	0	0	0	0	1	0	0	0	0
3	Business	0	0	0	0	1	0	0	0	0	0	0	0	0
4	IT/IS and Business	0	0	0	0	0	0	0	0	0	0	0	0	0
5	IT or IS	0	0	0	0	0	1	0	0	0	0	0	0	1
6	IT or IS	1	0	0	0	0	0	0	0	0	0	0	0	0
7	Business	0	0	0	0	0	0	0	0	0	0	0	0	0
8	Business	0	0	0	0	0	0	0	1	0	4	0	0	1
9	IT or IS	0	0	0	0	0	0	0	0	0	0	0	0	0
10	IT/IS and Business	0	0	0	0	0	0	0	2	7	0	1	2	2
11	IT/IS and Business	0	0	0	1	0	0	0	0	0	0	0	0	0
12	IT or IS	0	0	0	0	0	0	0	0	0	0	0	0	0
13	IT/IS and Business	3	1	1	0	0	0	0	0	0	0	0	0	0
14	IT or IS	0	0	0	0	0	0	0	0	0	0	0	0	0
15	IT/IS and Business	1	1	3	3	1	1	0	0	0	0	0	2	0
16	Business	0	0	0	1	0	0	0	0	0	0	0	0	0
17	IT/IS and Business	0	2	0	0	0	0	0	0	0	0	0	0	0
18	IT or IS	0	0	0	0	0	1	0	2	3	1	1	2	0
19	IT/IS and Business	0	0	0	0	0	0	0	2	3	1	0	0	0
20	Business	0	0	0	0	0	0	0	0	3	1	0	0	0
21	IT/IS and Business	0	0	0	0	1	0	0	0	2	0	0	0	0
22	Business	1	1	0	1	0	0	0	4	0	1	0	0	0
23	Business	0	0	0	0	0	0	0	0	0	0	0	0	0
24	IT or IS	1	0	0	0	0	0	0	0	5	1	0	0	0
25	IT/IS and Business	0	0	0	0	0	0	0	0	0	0	0	0	0
26	Business	0	0	0	0	0	0	0	0	0	6	1	0	0
27	Business	0	1	0	0	0	0	0	0	2	1	1	0	0
28	Business	0	0	0	0	0	0	0	0	3	1	0	0	1
29	IT or IS	1	0	0	0	0	0	0	0	2	0	0	0	0
30	Business	0	0	0	0	0	0	0	0	0	0	0	0	0
31	Business	0	0	0	0	0	0	0	0	0	0	0	0	1
32	Business	0	0	0	0	0	0	0	2	2	0	0	1	0
33	Business	0	0	0	0	0	0	0	0	0	0	0	0	1
34	Business	0	0	0	0	0	0	0	0	2	1	0	2	0
35	IT or IS	0	0	6	0	5	0	0	0	1	0	0	4	4

Document No.	Stakeholder	(2 9) /IS Development/IS Planning	(2 9 1) /IS Development/IS Planning/Customer levels of IT literacy	(2 9 2) /IS Development/IS Planning/Document business expectations	(2 9 4) /IS Development/IS Planning/Risk assessment	(2 9 5) /IS Development/IS Planning/System Architecture	(2 9 6) /IS Development/IS Planning/Document business processes	(2 17) /IS Development/Compatibility	(3) /HIGH RELIANCE ON IS	(4) /AGILITY & INNOVATIVENESS	(5) /BUSINESS & IS RELATIONSHIP	(5 1) /BUSINESS & IS RELATIONSHIP/Turn around time	(5 2) /BUSINESS & IS RELATIONSHIP/Service Level Agreements	(5 3) /BUSINESS & IS RELATIONSHIP/Different perspectives
36	Business	0	0	0	0	0	0	0	0	1	0	0	1	1
37	IT or IS	0	1	0	0	0	0	0	0	1	0	0	2	0
38	Business	0	0	1	2	0	2	1	0	4	0	1	2	0
39	IT or IS	0	0	0	0	0	0	1	0	1	0	0	0	0
40	IT/IS and Business	0	0	0	2	0	0	0	1	3	0	0	0	0
41	Business	0	0	0	0	0	0	0	0	1	0	0	0	0
42	Business	0	0	0	1	0	0	0	0	0	0	0	0	0
43	IT or IS	0	0	0	1	0	0	0	0	1	0	0	0	0
		8	7	11	12	8	5	2	14	48	18	5	18	12
								163						

Document No.	Stakeholder	(5 4) /BUSINESS & IS RELATIONSHIP/Business takes responsibility for IS	(5 5) /BUSINESS & IS RELATIONSHIP/Importance of joint team	(6) /CUSTOMER-FOCUSED & E-SERVICE QUALITY	(7) /IS EVALUATION	(7 1) /IS EVALUATION/Measurement of financial expenditure	(7 3) /IS EVALUATION/Measure against initial expectations	(7 4) /IS EVALUATION/Test Software	(7 6) /IS EVALUATION/Measuring Business value	(7 8) /IS EVALUATION/System Quality	(7 9) /IS EVALUATION/Monitor turnover	(7 10) /IS EVALUATION/Informal eval	(7 11) /IS EVALUATION/Site hit rate	(7 12) /IS EVALUATION/business & IS have different perspec
1	Business	0	0	0	0	0	0	0	1	0	0	0	0	0
2	IT or IS	0	1	0	1	0	0	0	0	0	1	0	0	0
3	Business	0	1	1	0	0	0	0	0	0	0	1	0	0
4	IT/IS and Business	0	0	3	0	0	0	0	0	0	0	0	0	0
5	IT or IS	0	4	4	0	0	0	0	0	0	1	0	0	0
6	IT or IS	1	4	2	5	8	0	1	6	0	0	0	0	2
7	Business	0	0	0	1	2	0	0	0	0	0	0	0	0
8	Business	2	2	0	1	0	0	0	1	0	0	3	0	0
9	IT or IS	0	0	0	2	0	0	0	1	0	0	0	0	0
10	IT/IS and Business	2	4	5	0	0	0	0	1	3	6	0	0	0
11	IT/IS and Business	0	0	6	1	0	0	0	0	0	3	0	2	0
12	IT or IS	0	0	4	0	0	0	0	0	0	0	0	0	0
13	IT/IS and Business	3	0	2	0	0	1	0	1	0	0	0	0	0
14	IT or IS	0	0	0	0	0	0	0	0	0	0	0	0	0
15	IT/IS and Business	3	0	1	0	0	1	1	1	0	0	0	0	0
16	Business	0	0	1	0	0	0	0	0	0	0	0	1	0
17	IT/IS and Business	0	0	0	6	2	0	0	0	0	0	0	0	0
18	IT or IS	1	1	0	1	0	0	2	0	1	0	0	0	0
19	IT/IS and Business	0	3	1	0	0	0	0	0	0	3	0	0	0
20	Business	2	4	9	3	0	0	0	0	0	1	0	0	0
21	IT/IS and Business	0	1	11	0	0	0	0	1	0	0	0	0	0
22	Business	1	2	9	1	0	0	0	2	0	0	0	0	5
23	Business	1	1	2	3	2	0	0	3	0	0	0	2	1
24	IT or IS	2	2	7	6	0	0	1	1	0	2	1	1	0
25	IT/IS and Business	0	0	0	0	0	0	0	0	0	0	0	0	0
26	Business	1	0	1	0	0	0	0	0	0	0	4	0	1
27	Business	0	1	1	0	0	0	0	1	0	0	0	1	1
28	Business	1	1	9	1	0	0	0	2	0	2	0	0	1
29	IT or IS	0	0	0	0	0	0	0	0	1	0	0	0	0
30	Business	0	0	0	0	1	0	0	1	0	2	1	3	0
31	Business	0	0	0	0	0	0	0	0	0	1	0	0	0
32	Business	0	2	9	0	0	0	0	0	0	1	4	0	0
33	Business	0	1	0	0	0	0	0	2	0	1	1	2	0
34	Business	0	0	0	0	0	0	0	0	0	0	0	2	0
35	IT or IS	0	2	0	0	0	0	1	0	0	0	0	0	0

Document No.	Stakeholder	(5 4) /BUSINESS & IS RELATIONSHIP/Business takes responsibility for IS	(5 5) /BUSINESS & IS RELATIONSHIP/Importance of joint team	(6) /CUSTOMER-FOCUSED & E-SERVICE QUALITY	(7) /IS EVALUATION	(7 1) /IS EVALUATION/Measurement of financial expenditure	(7 3) /IS EVALUATION/Measure against initial expectations	(7 4) /IS EVALUATION/Test Software	(7 6) /IS EVALUATION/Measuring Business value	(7 8) /IS EVALUATION/System Quality	(7 9) /IS EVALUATION/Monitor turnover	(7 10) /IS EVALUATION/Informal eval	(7 11) /IS EVALUATION/Site hit rate	(7 12) /IS EVALUATION/business & IS have different perspec
36	Business	0	5	8	0	1	0	0	2	0	3	2	1	0
37	IT or IS	0	4	0	0	0	0	0	0	0	0	0	0	0
38	Business	0	1	6	4	0	0	0	1	0	2	1	1	1
39	IT or IS	0	0	1	0	1	0	0	3	0	3	0	2	0
40	IT/IS and Business	0	0	4	2	0	0	0	2	0	2	0	0	0
41	Business	3	2	6	0	0	0	0	0	0	0	0	0	0
42	Business	0	0	0	0	0	0	0	0	0	1	1	0	0
43	IT or IS	0	0	1	0	0	0	0	0	0	0	0	0	0
		23	**49**	**114**	**38**	**17**	**2**	**6**	**33**	**5**	**35**	**19**	**18**	**12**
			125											

Document No.	Stakeholder	(7 13) /IS EVALUATION/Conversion Rate	(7 14) /IS EVALUATION/Measure Non-IS issues	(7 15) /IS EVALUATION/Exception Reporting	(7 16) /IS EVALUATION/Customer-Feedback	(7 16 1) /IS EVALUATION/Customer-Feedback/ Formal feedback	(7 16 2) /IS EVALUATION/Customer-Feedback/Informal feedback	(7 17) /IS EVALUATION/Web-site usage data	(7 18) /IS EVALUATION/no evaluation procedures	(8) /KEY IS FUNCTIONS OR CHARACTERISTICS	(8 1) /KEY IS FUNCTIONS OR CHARACTERISTICS/IS links with suppliers	(8 2) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Security	(8 3) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Web-interface	/KEY IS FUNCTIONS OR CHARACTERISTICS/ Web-Interface/ Web Content
1	Business	0	0	0	0	0	0	0	0	0	0	0	0	0
2	IT or IS	0	0	0	1	1	0	1	0	0	0	0	0	0
3	Business	0	0	0	0	0	0	0	1	0	0	0	0	0
4	IT/IS and Business	0	0	0	0	1	0	0	0	0	0	0	0	0
5	IT or IS	0	0	0	0	1	0	2	0	0	0	0	0	0
6	IT or IS	0	0	0	0	1	1	3	2	0	0	1	0	1
7	Business	0	0	0	0	1	0	0	0	0	0	0	0	0
8	Business	0	0	0	1	0	2	1	0	0	0	0	0	0
9	IT or IS	0	0	0	0	1	0	0	1	0	0	0	0	0
10	IT/IS and Business	0	1	2	0	0	0	1	0	0	0	0	0	0
11	IT/IS and Business	0	0	0	0	0	0	0	0	0	0	1	0	0
12	IT or IS	0	0	0	0	2	1	0	0	0	0	0	0	0
13	IT/IS and Business	0	0	0	0	1	0	0	0	0	1	1	0	0
14	IT or IS	0	0	0	0	0	0	0	0	0	1	0	0	0
15	IT/IS and Business	0	0	0	0	1	0	0	0	0	0	4	2	1
16	Business	0	0	0	0	0	0	1	0	0	0	0	4	0
17	IT/IS and Business	0	0	0	0	0	0	0	0	0	0	0	0	0
18	IT or IS	0	0	0	0	0	0	0	0	0	0	0	0	0
19	IT/IS and Business	0	0	0	0	0	0	0	0	1	3	2	0	0
20	Business	0	0	0	0	0	0	0	0	0	0	0	0	0
21	IT/IS and Business	0	0	0	0	0	2	0	0	0	2	1	0	0
22	Business	0	0	0	0	2	1	0	1	0	0	1	3	0
23	Business	0	0	0	0	0	0	2	0	0	0	0	2	0
24	IT or IS	0	0	0	0	0	1	2	0	0	0	0	1	0
25	IT/IS and Business	0	0	0	0	0	0	0	0	0	0	0	0	0
26	Business	0	0	0	0	0	0	0	0	0	0	1	0	1
27	Business	0	0	0	0	0	2	0	0	0	0	0	0	1
28	Business	1	0	0	0	0	0	0	0	0	3	0	0	0
29	IT or IS	0	0	0	0	0	0	0	0	0	0	0	0	0
30	Business	1	0	0	0	0	1	0	0	0	1	0	0	0
31	Business	0	0	0	0	0	0	0	0	0	0	0	0	0
32	Business	0	0	0	0	0	1	0	0	0	4	0	0	1
33	Business	0	0	0	0	0	0	0	1	0	0	0	1	0
34	Business	0	0	0	0	0	0	1	0	0	2	0	0	1
35	IT or IS	0	0	0	0	0	0	0	0	0	0	0	2	0

Document No.	Stakeholder	(7 13) /IS EVALUATION/Conversion Rate	(7 14) /IS EVALUATION/Measure Non-IS issues	(7 15) /IS EVALUATION/Exception Reporting	(7 16) /IS EVALUATION/Customer-Feedback	(7 16 1) /IS EVALUATION/Customer-Feedback/ Formal feedback	(7 16 2) /IS EVALUATION/Customer-Feedback/Informal feedback	(7 17) /IS EVALUATION/Web-site usage data	(7 18) /IS EVALUATION/no evaluation procedures	(8) /KEY IS FUNCTIONS OR CHARACTERISTICS	(8 1) /KEY IS FUNCTIONS OR CHARACTERISTICS/IS links with suppliers	(8 2) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Security	(8 3) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Web-interface	/KEY IS FUNCTIONS OR CHARACTERISTICS/ Web-interface/ Web Content
36	Business	0	0	0	0	0	0	0	0	0	0	0	2	0
37	IT or IS	0	0	0	0	0	0	0	0	0	0	0	0	1
38	Business	1	3	0	0	0	0	1	0	0	2	1	0	0
39	IT or IS	0	0	0	0	0	0	0	0	0	1	1	0	0
40	IT/IS and Business	0	0	0	0	1	0	0	0	0	0	0	0	0
41	Business	0	0	0	0	0	1	0	0	0	0	2	0	0
42	Business	0	0	0	0	0	0	1	0	0	0	0	0	0
43	IT or IS	0	0	0	0	0	0	0	0	0	0	0	0	0
		3	**4**	**2**	**2**	**13**	**13**	**16**	**6**	**1**	**20**	**16**	**17**	**7**
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Document No.	Stakeholder	(8 3 2) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Web-interface/User-Friendly	(8 3 3) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Web-interface/Branding	(8 3 4) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Web-interface/Personalisation	(8 3 5) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Web-interface/Trust	(8 4) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Site Availibility	(8 5) /KEY IS FUNCTIONS OR CHARACTERISTICS/ CRM system	(8 6) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Data quality	(8 7) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Controls	(8 8) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Evaluation data	(8 9) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Updating DBase	(8 10) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Payment gateway	(8 11) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Site visibility	(8 12) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Remote management of Web
1	Business	0	0	0	0	0	0	0	0	0	0	0	0	0
2	IT or IS	0	0	0	0	0	0	0	0	0	0	0	0	0
3	Business	0	0	0	0	0	0	0	0	1	0	0	0	0
4	IT/IS and Business	0	0	1	0	0	0	0	0	0	0	0	0	0
5	IT or IS	2	0	0	0	0	0	0	0	2	1	0	0	0
6	IT or IS	0	1	0	0	0	0	0	0	0	0	0	0	0
7	Business	0	0	0	0	0	0	0	0	0	0	0	0	0
8	Business	0	0	1	0	0	0	0	0	0	0	0	0	0
9	IT or IS	0	0	0	0	0	0	0	0	0	0	0	0	0
10	IT/IS and Business	0	0	0	0	0	0	0	0	0	0	0	0	0
11	IT/IS and Business	1	0	0	0	1	1	5	0	0	4	1	0	2
12	IT or IS	0	0	0	0	1	2	0	0	0	0	0	1	0
13	IT/IS and Business	0	0	0	0	0	0	0	0	0	0	0	0	0
14	IT or IS	0	0	0	0	0	0	0	0	0	0	0	0	0
15	IT/IS and Business	0	0	0	0	0	0	0	0	0	1	0	0	0
16	Business	2	1	0	0	0	0	0	0	0	0	0	0	0
17	IT/IS and Business	0	0	0	0	0	0	0	0	1	0	0	0	0
18	IT or IS	0	0	0	0	1	1	3	1	0	0	0	0	0
19	IT/IS and Business	0	0	0	0	0	2	2	0	2	0	0	0	0
20	Business	1	0	1	0	0	2	1	0	0	1	0	0	0
21	IT/IS and Business	1	0	0	2	0	0	0	0	0	3	0	0	0
22	Business	0	0	0	0	1	0	0	0	1	1	1	0	0
23	Business	1	0	0	0	0	0	0	0	0	0	0	1	0
24	IT or IS	0	0	0	0	0	0	0	1	2	0	0	0	0
25	IT/IS and Business	0	0	0	0	0	0	0	0	0	0	0	0	0
26	Business	1	0	0	0	0	0	0	0	0	5	0	1	0
27	Business	0	0	0	0	0	0	0	0	0	0	0	2	3
28	Business	0	0	3	0	0	3	5	0	3	4	0	1	2
29	IT or IS	0	0	0	0	0	0	0	0	0	6	0	0	0
30	Business	0	1	0	0	0	0	0	0	0	0	0	0	0
31	Business	0	0	0	0	0	0	0	0	0	0	0	0	0
32	Business	2	3	0	0	2	2	6	0	0	0	0	0	0
33	Business	2	0	0	0	0	0	0	0	0	0	0	1	0
34	Business	0	0	0	2	0	1	1	0	0	4	0	0	0
35	IT or IS	0	0	0	0	0	0	1	1	0	0	0	1	0

Document No.	Stakeholder	(8 3 2) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Web-interface/User-Friendly	(8 3 3) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Web-interface/Branding	(8 3 4) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Web-interface/Personalisation	(8 3 5) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Web-interface/Trust	(8 4) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Site Availibility	(8 5) /KEY IS FUNCTIONS OR CHARACTERISTICS/ CRM system	(8 6) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Data quality	(8 7) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Controls	(8 8) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Evaluation data	(8 9) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Updating DBase	(8 10) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Payment gateway	(8 11) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Site visibility	(8 12) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Remote management of Web
36	Business	1	0	0	1	0	0	0	0	0	0	0	1	6
37	IT or IS	3	0	0	0	0	0	0	0	0	0	0	1	0
38	Business	0	0	0	1	0	0	2	1	0	0	0	0	0
39	IT or IS	0	0	0	1	0	0	0	0	0	1	0	0	0
40	IT/IS and Business	1	0	0	0	0	0	3	0	2	2	0	0	0
41	Business	2	0	1	0	1	0	0	0	0	0	0	0	0
42	Business	1	1	0	0	0	0	1	0	0	1	0	0	0
43	IT or IS	0	0	0	0	0	0	0	0	0	0	0	0	0
		21	**7**	**7**	**7**	**7**	**14**	**30**	**4**	**14**	**34**	**2**	**10**	**13**

NVIVO CONTENT ANALYSIS REPORT

Document No.	Stakeholder	(8 13) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Search Engine	(8 14) /KEY IS FUNCTIONS OR CHARACTERISTICS/IS Integration	(8 15) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Speed	(8 16) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Fulfillment	(8 17) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Keep look and feel constant	(8 18) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Channels for human touch	(9) /BUSINESS MANAGEMENT	(9 1) /BUSINESS MANAGEMENT/Disaster Recovery Plans	(9 2) /BUSINESS MANAGEMENT/Top Mng Support	(9 3) /BUSINESS MANAGEMENT/Business Principles Apply	(9 3 1) /BUSINESS MANAGEMENT/Business Principles Apply/Robust business processes	(9 3 2) /BUSINESS MANAGEMENT/Business Principles Apply/Market analysis	(9 4) /BUSINESS MANAGEMENT/Business Strategy drives IS strategy
1	Business	0	0	0	0	0	0	0	0	0	0	0	1	0
2	IT or IS	0	0	0	0	0	0	0	0	0	0	0	0	0
3	Business	0	0	0	0	0	0	0	0	0	0	0	0	0
4	IT/IS and Business	0	0	0	0	0	0	0	0	0	0	0	0	0
5	IT or IS	0	0	0	0	0	0	0	0	0	0	0	0	0
6	IT or IS	0	0	0	0	1	0	0	0	0	0	0	0	0
7	Business	0	0	0	0	0	0	0	0	0	0	0	0	0
8	Business	0	0	1	0	0	0	0	0	0	1	0	0	4
9	IT or IS	0	0	0	0	0	0	0	0	1	1	0	0	0
10	IT/IS and Business	0	3	1	1	0	0	0	0	0	2	0	0	0
11	IT/IS and Business	0	0	0	0	0	0	0	0	0	0	0	0	0
12	IT or IS	0	0	0	0	0	0	1	1	0	0	0	0	0
13	IT/IS and Business	0	1	0	0	0	0	0	0	0	1	0	0	2
14	IT or IS	0	0	0	0	0	0	0	0	0	0	0	0	0
15	IT/IS and Business	0	0	0	0	0	0	0	0	0	3	3	2	3
16	Business	0	0	0	0	0	0	0	0	0	0	0	1	0
17	IT/IS and Business	0	0	0	0	0	0	0	0	0	0	2	0	1
18	IT or IS	0	0	0	0	0	0	0	0	0	0	0	0	0
19	IT/IS and Business	0	0	0	0	0	0	1	0	0	3	0	0	0
20	Business	0	0	0	0	0	0	0	0	0	1	0	0	1
21	IT/IS and Business	0	0	0	0	0	0	0	0	0	1	0	0	2
22	Business	0	1	0	0	0	0	0	0	0	2	0	0	0
23	Business	0	0	0	0	0	0	0	0	2	0	0	0	0
24	IT or IS	0	0	0	0	0	0	0	0	0	0	0	0	0
25	IT/IS and Business	0	0	0	0	0	0	0	0	0	0	0	0	0
26	Business	0	0	0	0	0	0	0	0	0	2	0	0	0
27	Business	0	0	0	0	0	0	2	0	0	0	0	0	0
28	Business	6	4	0	0	0	0	0	0	1	0	0	0	0
29	IT or IS	0	0	0	0	0	0	0	0	0	0	0	0	0
30	Business	0	0	0	0	0	0	0	0	0	0	0	1	1
31	Business	0	0	0	0	0	0	0	0	0	0	0	0	0
32	Business	0	2	0	2	0	0	0	0	0	1	1	1	0
33	Business	0	0	3	0	0	0	0	0	1	0	0	0	3
34	Business	0	0	0	1	0	0	0	0	0	2	3	0	0
35	IT or IS	0	0	0	0	0	0	0	0	0	0	0	0	0

Document No.	Stakeholder	(8 13) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Search Engine	(8 14) /KEY IS FUNCTIONS OR CHARACTERISTICS/IS Integration	(8 15) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Speed	(8 16) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Fulfillment	(8 17) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Keep look and feel constant	(8 18) /KEY IS FUNCTIONS OR CHARACTERISTICS/ Channels for human touch	(9) /BUSINESS MANAGEMENT	(9 1) /BUSINESS MANAGEMENT/Disaster Recovery Plans	(9 2) /BUSINESS MANAGEMENT/Top Mng Support	(9 3) /BUSINESS MANAGEMENT/Business Principles Apply	(9 3 1) /BUSINESS MANAGEMENT/Business Principles Apply/Robust business processes	(9 3 2) /BUSINESS MANAGEMENT/Business Principles Apply/Market analysis	(9 4) /BUSINESS MANAGEMENT/Business Strategy drives IS strategy
36	Business	0	0	1	0	0	0	0	0	0	1	0	4	0
37	IT or IS	1	0	0	0	0	0	0	0	0	1	1	0	0
38	Business	0	4	0	2	1	0	0	0	1	2	0	1	2
39	IT or IS	0	3	0	3	0	0	0	0	0	2	0	0	0
40	IT/IS and Business	0	1	0	3	0	2	0	0	0	1	0	0	0
41	Business	0	0	1	3	0	1	0	0	0	0	0	0	1
42	Business	1	0	0	0	0	0	0	0	0	0	0	0	0
43	IT or IS	0	0	0	0	0	0	1	0	0	1	0	0	0
		8	19	7	15	2	3	5	1	6	28	10	11	20
							285							

Document No.	Stakeholder	(9 5) /BUSINESS MANAGEMENT/Change Management	(9 6) /BUSINESS MANAGEMENT/Strong Business Model Reqd~	S MANAGEMENT/Strong Business Model Reqd~/Type of Product	(9 7) /BUSINESS MANAGEMENT/Marketing	(9 8) /BUSINESS MANAGEMENT/Strong Business Experience	(9 9) /BUSINESS MANAGEMENT/Daily management	(9 10) /BUSINESS MANAGEMENT/Procurement of goods	(9 11) /BUSINESS MANAGEMENT/Project Management	(9 12) /BUSINESS MANAGEMENT/Lack of IS knowledge	(9 13) /BUSINESS MANAGEMENT/Management Reports	(9 14) /BUSINESS MANAGEMENT/Manage environmental factors	(10) /IS Management	(10 1) /IS Management/System Maintainance
1	Business	0	1	0	0	0	0	0	0	0	0	0	0	0
2	IT or IS	0	0	0	0	0	0	0	0	0	0	0	0	0
3	Business	0	1	0	0	0	0	0	0	0	0	0	0	0
4	IT/IS and Business	0	0	0	0	0	0	0	0	0	0	0	0	0
5	IT or IS	0	0	0	0	1	0	0	0	1	0	0	0	0
6	IT or IS	0	0	0	0	0	0	0	0	0	0	0	0	1
7	Business	0	0	0	0	0	0	0	0	0	0	0	0	0
8	Business	0	1	0	3	1	0	1	0	5	0	0	0	0
9	IT or IS	0	0	0	0	0	0	0	0	0	0	0	0	0
10	IT/IS and Business	0	0	0	0	0	3	3	0	0	5	0	0	4
11	IT/IS and Business	0	0	0	0	0	0	0	0	0	0	0	0	0
12	IT or IS	0	0	0	0	0	0	0	0	0	0	0	0	0
13	IT/IS and Business	1	0	0	0	0	0	0	0	0	0	0	0	0
14	IT or IS	0	0	0	0	0	0	0	0	0	0	0	0	0
15	IT/IS and Business	4	0	0	0	0	0	1	0	0	0	0	0	0
16	Business	0	0	0	1	0	0	0	0	0	0	0	0	0
17	IT/IS and Business	1	3	1	1	0	0	0	0	0	0	0	0	0
18	IT or IS	0	0	0	0	0	0	1	0	0	0	0	3	0
19	IT/IS and Business	0	1	1	1	2	0	0	0	0	0	0	2	0
20	Business	0	1	1	2	2	0	0	0	0	0	0	0	0
21	IT/IS and Business	0	1	0	1	0	0	2	0	0	0	0	0	0
22	Business	0	0	0	0	0	0	0	0	0	0	0	1	0
23	Business	0	0	1	3	0	0	0	0	0	0	0	0	0
24	IT or IS	0	0	0	4	0	0	0	2	0	0	1	3	6
25	IT/IS and Business	0	1	0	0	0	0	0	0	0	0	0	0	0
26	Business	0	0	1	1	0	0	0	0	0	0	0	0	0
27	Business	0	0	1	2	0	0	0	0	1	0	0	0	0
28	Business	0	0	0	6	0	4	0	0	0	3	0	0	0
29	IT or IS	0	0	0	0	0	0	0	0	0	0	0	0	0
30	Business	0	0	0	0	0	1	0	0	0	0	0	0	0
31	Business	0	0	0	0	0	0	0	0	0	0	0	0	0
32	Business	0	1	1	2	2	3	1	0	2	0	1	0	3
33	Business	0	2	0	0	0	2	0	0	1	0	0	0	0
34	Business	0	1	0	0	0	0	2	0	1	0	1	0	0
35	IT or IS	0	0	0	1	0	0	0	0	0	0	0	0	1

Document No.	Stakeholder	(9 5) /BUSINESS MANAGEMENT/Change Management	(9 6) /BUSINESS MANAGEMENT/Strong Business Model Reqd~	S MANAGEMENT/Strong Business Model Reqd~/Type of Product	(9 7) /BUSINESS MANAGEMENT/Marketing	(9 8) /BUSINESS MANAGEMENT/Strong Business Experience	(9 9) /BUSINESS MANAGEMENT/Daily management	(9 10) /BUSINESS MANAGEMENT/Procurement of goods	(9 11) /BUSINESS MANAGEMENT/Project Management	(9 12) /BUSINESS MANAGEMENT/Lack of IS knowledge	(9 13) /BUSINESS MANAGEMENT/Management Reports	(9 14) /BUSINESS MANAGEMENT/Manage environmental factors	(10) /IS Management	(10 1) /IS Management/System Maintainance
36	Business	0	1	1	2	0	1	0	0	3	0	0	1	0
37	IT or IS	0	0	2	1	0	0	0	0	0	0	0	0	0
38	Business	0	3	0	0	0	0	4	0	5	0	0	0	0
39	IT or IS	0	9	1	1	0	0	3	0	0	0	1	0	0
40	IT/IS and Business	0	1	0	0	0	1	0	0	0	0	0	0	1
41	Business	0	3	0	0	1	1	3	1	2	0	0	0	2
42	Business	0	1	0	0	0	0	0	0	0	0	0	0	0
43	IT or IS	0	0	0	0	0	0	0	0	0	0	0	3	0
		6	32	11	32	9	16	21	3	21	8	4	13	18
												244		

Document No.	Stakeholder	(10 2) /IS Management/disaster recovery	(10 3) /IS Management/Managing Projects	(10 4) /IS Management/IS Staff turnover	(10 5) /IS Management/Knowledgeable about business	totals
1	Business	0	0	0	0	3
2	IT or IS	0	0	0	0	7
3	Business	0	0	0	0	7
4	IT/IS and Business	0	0	0	0	5
5	IT or IS	0	0	0	1	23
6	IT or IS	0	0	0	0	50
7	Business	0	0	0	0	5
8	Business	0	0	1	0	43
9	IT or IS	0	0	0	0	8
10	IT/IS and Business	1	0	0	0	79
11	IT/IS and Business	0	2	0	0	22
12	IT or IS	0	0	0	0	9
13	IT/IS and Business	0	0	0	0	22
14	IT or IS	0	0	0	0	2
15	IT/IS and Business	0	1	0	0	45
16	Business	0	0	0	0	17
17	IT/IS and Business	0	0	0	0	25
18	IT or IS	0	0	0	0	30
19	IT/IS and Business	0	0	0	0	47
20	Business	0	0	0	0	41
21	IT/IS and Business	0	0	0	0	35
22	Business	0	0	0	0	47
23	Business	0	0	0	0	28
24	IT or IS	1	0	0	0	56
25	IT/IS and Business	0	0	0	0	5
26	Business	0	0	0	0	30
27	Business	1	0	1	0	35
28	Business	0	0	0	0	83
29	IT or IS	0	5	2	0	20
30	Business	0	0	0	0	20
31	Business	0	0	0	0	2
32	Business	0	0	0	2	74
33	Business	0	0	0	1	28
34	Business	0	0	0	0	34
35	IT or IS	0	0	0	0	36

Document No.	Stakeholder	(10 2) /IS Management/disaster recovery	(10 3) /IS Management/Managing Projects	(10 4) /IS Management/IS Staff turnover	(10 5) /IS Management/Knowledgeable about business	totals
36	Business	1	0	0	0	59
37	IT or IS	0	0	0	0	20
38	Business	2	0	1	0	83
39	IT or IS	0	0	0	0	46
40	IT/IS and Business	0	0	0	0	39
41	Business	0	0	0	0	43
42	Business	0	0	0	0	10
43	IT or IS	2	0	0	0	13
		8	**8**	**5**	**4**	**1330**
					56	

NVIVO CONTENT ANALYSIS SUMMARY

		% of total
(1) /High Costs	37	3%
(2) /IS Development	11	1%
(2 1) /IS Development/Driven by business	26	2%
(2 2) /IS Development/Methodology	13	1%
(2 3) /IS Development/Prototyping	2	0%
(2 4) /IS Development/Easy to create a web-site	7	1%
(2 5) /IS Development/In-house development	6	0%
(2 6) /IS Development/Outsourced development	28	2%
(2 7) /IS Development/Testing	9	1%
(2 8) /IS Development/build vs buy	8	1%
(2 9) /IS Development/IS Planning	8	1%
(2 9 1) /IS Development/IS Planning/Customer levels of IT literacy	7	1%
(2 9 2) /IS Development/IS Planning/Document business expectations	11	1%
(2 9 4) /IS Development/IS Planning/Risk assessment	12	1%
(2 9 5) /IS Development/IS Planning/System Architecture	8	1%
(2 9 6) /IS Development/IS Planning/Document business processes	5	0%
(2 17) /IS Development/Compatibility	2	0%
	163	12%
(3) /HIGH RELIANCE ON IS	14	1%
(4) /AGILITY & INNOVATIVENESS	48	4%
(5) /BUSINESS & IS RELATIONSHIP	18	1%
(5 1) /BUSINESS & IS RELATIONSHIP/Turnaround time	5	0%
(5 2) /BUSINESS & IS RELATIONSHIP/Service Level Agreements	18	1%
(5 3) /BUSINESS & IS RELATIONSHIP/Different perspectives	12	1%
(5 4) /BUSINESS & IS RELATIONSHIP/Business takes responsibility for IS	23	2%
(5 5) /BUSINESS & IS RELATIONSHIP/Importance of joint team	49	4%
	125	9%
(6) /CUSTOMER-FOCUSED & E-SERVICE QUALITY	114	9%
(7) /IS EVALUATION	38	3%
(7 1) /IS EVALUATION/Measurement of financial expenditure	17	1%
(7 3) /IS EVALUATION/Measure against initial expectations	2	0%
(7 4) /IS EVALUATION/Test Software	6	0%
(7 6) /IS EVALUATION/Measuring Business value	33	2%
(7 8) /IS EVALUATION/System Quality	5	0%
(7 9) /IS EVALUATION/Monitor turnover	35	3%
(7 10) /IS EVALUATION/Informal eval	19	1%
(7 11) /IS EVALUATION/Site hit rate	18	1%

(7 12) /IS EVALUATION/business & IS have different perspec	12	1%
(7 13) /IS EVALUATION/Conversion Rate	3	0%
(7 14) /IS EVALUATION/Measure Non-IS issues	4	0%
(7 15) /IS EVALUATION/Exception Reporting	2	0%
(7 16) /IS EVALUATION/Customer-Feedback	2	0%
(7 16 1) /IS EVALUATION/Customer-Feedback/Formal feedback	13	1%
(7 16 2) /IS EVALUATION/Customer-Feedback/Informal feedback	13	1%
(7 17) /IS EVALUATION/Web-site usage data	16	1%
(7 18) /IS EVALUATION/no evaluation procedures	6	0%
	244	18%
(8) /KEY IS FUNCTIONS OR CHARACTERISTICS	1	0%
(8 1) IS links with suppliers	20	2%
(8 2) Security	16	1%
(8 3) Web-interface	17	1%
(8 3 1) Web Content	7	1%
(8 3 2) User-Friendly	21	2%
(8 3 3) Branding	7	1%
(8 3 4) Personalisation	7	1%
(8 3 5) Trust	7	1%
(8 4) Site Availibility	7	1%
(8 5) CRM system	14	1%
(8 6) Data quality	30	2%
(8 7) Controls	4	0%
(8 8) Evaluation data	14	1%
(8 9) Updating Dbase	34	3%
(8 10) Payment gateway	2	0%
(8 11) Site visibility	10	1%
(8 12) Remote management of Web	13	1%
(8 13) Search Engine	8	1%
(8 14) IS Integration	19	1%
(8 15) Speed	7	1%
(8 16) Fulfillment	15	1%
(8 17) Keep look and feel constant	2	0%
(8 18) Channels for human touch	3	0%
	285	21%
(9) BUSINESS MANAGEMENT	5	0.38
(9 1) Disaster Recovery Plans	1	0.08
(9 2) Top Mng Support	6	0.45
(9 3) Business Principles Apply	28	2.11
(9 3 1) Robust business processes	10	0.75
(9 3 2) /BUSINESS MANAGEMENT/Business Principles Apply/Market analysis	11	0.83
(9 4)Business Strategy drives IS strategy	20	1.50
(9 5) Change Management	6	0.45
(9 6) Strong Business Model Reqd~	32	2.41
(9 6 1) Type of Product	11	0.83
(9 7) Marketing	32	2.41
(9 8) Strong Business Experience	9	0.68
(9 9) Daily management	16	1.20

(9 10)Procurement of goods	21	1.58
(9 11) Project Management	3	0.23
(9 12) Lack of IS knowledge	21	1.58
(9 13) Management Reports	8	0.60
(9 14) Manage environmental factors	4	0.30
	244	**18.35**
(10) /IS Management	13	0.98
(10 1) System Maintainance	18	1.35
(10 2)disaster recovery	8	0.60
(10 3) Managing Projects	8	0.60
(10 4) IS Staff turnover	5	0.38
(10 5)Knowledgeable about business	4	0.30
	56	4.21

NVIVO CONTENT ANALYSIS BY STAKEHOLDER GROUPING

CATEGORY/SUBCATEGORY	IT Stake-holders	sub totals		Business Stake-holders	sub totals		IT/Bus Stake-holders	sub totals	
(1) /High Costs	6	6	0.5	21	21	1.05	10	10	
		2%			3%			3%	
(2) /IS Development	2			4			5		
(2 1) /IS Development/Driven by business	4			19			3		
(2 2) /IS Development/Methodology	6			3			4		
(2 3) /IS Development/Prototyping	1			0			1		
(2 4) /IS Development/Easy to create a web-site	5			0			2		
(2 5) /IS Development/In-house development	0			5			1		
(2 6) /IS Development/Outsourced development	5			20			3		
(2 7) /IS Development/Testing	4			4			1		
(2 8) /IS Development/build vs buy	3			3			2		
(2 9) /IS Development/IS Planning	3			1			4		
(2 9 1) /IS Development/IS Planning/Customer levels of IT literacy	1			2			4		
(2 9 2) /IS Development/IS Planning/Document business expectations	6			1			4		
(2 9 4) /IS Development/IS Planning/Risk assessment	1			5			6		
(2 9 5) /IS Development/IS Planning/System Architecture	5			1			2		
(2 9 6) /IS Development/IS Planning/Document business processes	2			2			1		
(2 17) /IS Development/Compatibility	1	49	3.8	1	71	3.55	0	43	4.3
		15%			10%			13%	
(3) /HIGH RELIANCE ON IS	2	2	0.2	7	7	0.35	5	5	0.5
		1%			1%			2%	
(4) /AGILITY & INNOVATIVENESS	15	15	1.2	18	18	0.9	15	15	1.5
		5%			3%			5%	

NVIVO CONTENT ANALYSIS BY STAKEHOLDER GROUPING

CATEGORY/SUBCATEGORY	IT Stake-holders	sub totals		Business Stake-holders	sub totals		IT/Bus Stake-holders	sub totals	
(5) /BUSINESS & IS RELATIONSHIP	2			15			1		
(5 1) /BUSINESS & IS RELATIONSHIP/Turnaround time	1			3			1		
(5 2) /BUSINESS & IS RELATIONSHIP/Service Level Agreements	8			6			4		
(5 3) /BUSINESS & IS RELATIONSHIP/Different perspectives	5			5			2		
(5 4) /BUSINESS & IS RELATIONSHIP/Business takes responsibility for IS	4			11			8		
(5 5) /BUSINESS & IS RELATIONSHIP/Importance of joint team	18	38	2.9	23	63	3.15	8	24	2.4
		12%			9%			7%	
(6) /CUSTOMER-FOCUSED & E-SERVICE QUALITY	19	19	1.5	62	62	3.1	33	33	3.3
		6%			9%			10%	
(7) /IS EVALUATION	15			14			9		
(7 1) /IS EVALUATION/Measurement of financial expenditure	9			6			2		
(7 3) /IS EVALUATION/Measure against initial expectations	0			0			2		
(7 4) /IS EVALUATION/Test Software	5			0			1		
(7 6) /IS EVALUATION/Measuring Business value	11			16			6		
(7 8) /IS EVALUATION/System Quality	2			0			3		
(7 9) /IS EVALUATION/Monitor turnover	7			14			14		
(7 10) /IS EVALUATION/Informal eval	1			18			0		
(7 11) /IS EVALUATION/Site hit rate	3			13			2		
(7 12) /IS EVALUATION/business & IS have different perspec	2			10			0		
(7 13) /IS EVALUATION/Conversion Rate	0			3			0		
(7 14) /IS EVALUATION/Measure Non-IS issues	0			3			1		
(7 15) /IS EVALUATION/Exception Reporting	0			0			2		
(7 16) /IS EVALUATION/Customer-Feedback	1			1			0		
(7 16 1) /IS EVALUATION/Customer-Feedback/Formal feedback	6			3			4		
(7 16 2) /IS EVALUATION/Customer-Feedback/Informal feedback	3			8			2		
(7 17) /IS EVALUATION/Web-site usage data	8			7			1		
(7 18) /IS EVALUATION/no evaluation procedures	3	76	5.8	3	119	5.95	0	49	4.9
		24%			17%			15%	

NVIVO CONTENT ANALYSIS BY STAKEHOLDER GROUPING

CATEGORY/SUBCATEGORY	IT Stake-holders	sub totals		Business Stake-holders	sub totals		IT/Bus Stake-holders	sub totals	
(8) /KEY IS FUNCTIONS OR CHARACTERISTICS	0			0			1		
(8 1) /KEY IS FUNCTIONS OR CHARACTERISTICS/IS links with suppliers	2			12			6		
(8 2) /KEY IS FUNCTIONS OR CHARACTERISTICS/Security	2			5			9		
(8 3) /KEY IS FUNCTIONS OR CHARACTERISTICS/Web-interface	3			12			2		
(8 3 1) /KEY IS FUNCTIONS OR CHARACTERISTICS/Web-interface/Web Content	2			4			1		
(8 3 2) /KEY IS FUNCTIONS OR CHARACTERISTICS/Web-Interface/User-Friendly	5			13			3		
(8 3 3) /KEY IS FUNCTIONS OR CHARACTERISTICS/Web-interface/Branding	1			6			0		
(8 3 4) /KEY IS FUNCTIONS OR CHARACTERISTICS/Web-interface/Personalisation	0			6			1		
(8 3 5) /KEY IS FUNCTIONS OR CHARACTERISTICS/Web-interface/Trust	1			4			2		
(8 4) /KEY IS FUNCTIONS OR CHARACTERISTICS/Site Availibility	1			4			2		
(8 5) /KEY IS FUNCTIONS OR CHARACTERISTICS/CRM system	1			8			5		
(8 6) /KEY IS FUNCTIONS OR CHARACTERISTICS/Data quality	4			16			10		
(8 7) /KEY IS FUNCTIONS OR CHARACTERISTICS/Controls	3			1			0		
(8 8) /KEY IS FUNCTIONS OR CHARACTERISTICS/Evaluation data	4			5			5		
(8 9) /KEY IS FUNCTIONS OR CHARACTERISTICS/Updating DBase	9			16			9		
(8 10) /KEY IS FUNCTIONS OR CHARACTERISTICS/Payment gateway	0			1			1		
(8 11) /KEY IS FUNCTIONS OR CHARACTERISTICS/Site visibility	2			7			1		
(8 12) /KEY IS FUNCTIONS OR CHARACTERISTICS/Remote management of Web	0			11			2		
(8 13) /KEY IS FUNCTIONS OR CHARACTERISTICS/Search Engine	1			7			0		
(8 14) /KEY IS FUNCTIONS OR CHARACTERISTICS/IS Integration	3			11			5		

NVIVO CONTENT ANALYSIS BY STAKEHOLDER GROUPING

CATEGORY/SUBCATEGORY	IT Stake-holders	sub totals		Business Stake-holders	sub totals		IT/Bus Stake-holders	sub totals	
(8 15) /KEY IS FUNCTIONS OR CHARACTERISTICS/Speed	0			6			1		
(8 16) /KEY IS FUNCTIONS OR CHARACTERISTICS/Fulfillment	3			8			4		
(8 17) /KEY IS FUNCTIONS OR CHARACTERISTICS/Keep look and feel constant	1			1			0		
(8 18) /KEY IS FUNCTIONS OR CHARACTERISTICS/Channels for human touch	0	48	3.7	1	165	8.25	2	72	7.2
		15%			24%			22%	

NVIVO CONTENT ANALYSIS BY STAKEHOLDER GROUPING

CATEGORY/SUBCATEGORY	IT Stake-holders	sub totals		Business Stake-holders	sub totals		IT/Bus Stake-holders	sub totals	
(9) /BUSINESS MANAGEMENT	2			2			1		
(9 1) /BUSINESS MANAGEMENT/Disaster Recovery Plans	1			0			0		
(9 2) /BUSINESS MANAGEMENT/Top Mng Support	1			5			0		
(9 3) /BUSINESS MANAGEMENT/Business Principles Apply	5			12			11		
(9 3 1) /BUSINESS MANAGEMENT/Business Principles Apply/Robust business processes	1			4			5		
(9 3 2) /BUSINESS MANAGEMENT/Business Principles Apply/Market analysis	0			9			2		
(9 4) /BUSINESS MANAGEMENT/Business Strategy drives IS strategy	0			12			8		
(9 5) /BUSINESS MANAGEMENT/Change Management	0			0			6		
(9 6) /BUSINESS MANAGEMENT/Strong Business Model Reqd~	9			16			7		
(9 6 1) /BUSINESS MANAGEMENT/Strong Business Model Reqd~/Type of Product	3			6			2		
(9 7) /BUSINESS MANAGEMENT/Marketing	7			22			3		
(9 8) /BUSINESS MANAGEMENT/Strong Business Experience	1			6			2		
(9 9) /BUSINESS MANAGEMENT/Daily management	0			12			4		
(9 10) /BUSINESS MANAGEMENT/Procurement of goods	4			11			6		
(9 11) /BUSINESS MANAGEMENT/Project Management	2			1			0		
(9 12) /BUSINESS MANAGEMENT/Lack of IS knowledge	1			20			0		
(9 13) /BUSINESS MANAGEMENT/Management Reports	0			3			5		
(9 14) /BUSINESS MANAGEMENT/Manage environmental factors	2	39	3.0	2	143	7.15	0	62	6.2
		12%			21%			19%	

NVIVO CONTENT ANALYSIS BY STAKEHOLDER GROUPING

CATEGORY/SUBCATEGORY	IT Stake-holders	sub totals		Business Stake-holders	sub totals		IT/Bus Stake-holders	sub totals	
(10) /IS Management	9			2			2		
(10 1) /IS Management/System Maintainance	8			5			5		
(10 2) /IS Management/disaster recovery	3			4			1		
(10 3) /IS Management/Managing Projects	5			0			3		
(10 4) /IS Management/IS Staff turnover	2			3			0		
(10 5) /IS Management/Knowledgeable about business	1	28	2.2	3	17	0.85	0	11	1.1
		9%			2%			3%	
					0%			0%	
totals	320			686			324		
	1330								

Evaluating e-Commerce Success – A Case Study

Abstract

In the business community the past decade has been characterised by debate over the value or effectiveness of e-Commerce and how this type of technology needs to be implemented. During this period the business world has witnessed many examples of failures of Internet based business. There is little doubt that the high failure rate in Dot.Coms had much to do with misconceptions regarding the ease with which e-Commerce could be implemented. Unrealistic expectations caused tried and tested business rules to be abandoned as hyperbole over took sound business sense. Although it is clear today that the Internet and the Web can facilitate business processes to add value to organisations, this technology has to be managed with considerable care. This paper reports on a case study conducted in kalahari.net, a well known South African e-Tailing business.

This case study highlights several valuable lessons to do with the evaluation of an e-Commerce investment and how to ensure its success. Specifically the case study closely examines aspects of kalahari.net's IS management policy, and identifies a set of preliminary e-Commerce success dimensions.

Key words

e-Business, e-Commerce, Internet business, web-facilitated business, Information Systems Management, business evaluation, IS success

In brick and mortar organizations, applications support the business, but in e-Businesses applications are the business (Kroll, 2001).

1. INTRODUCTION

In the ten years, approximately, since e-Commerce became a major issue there have been many attempts to create and operate successful businesses facilitated by this technology. The establishment of a very large number of Dot.Com businesses during the second half of the 1990s reflects the high hopes which were placed in this technology. Most of these attempts have failed and the reasons for such failures are well catalogued (See for example Ames, 2001; Carton, 2001). The number of successes has been relatively small and the lessons, which can be learnt from these organisations, are not yet well known. What has become clear though, is that basic business principles still hold (Remenyi et. al. 2004).

Over the last decade, a multitude of studies have focused on various aspects of the practice of e-Commerce. Several of these studies have focused on measures and frameworks for evaluating the success of the IS function. DeLone and McLean's review of the academic and trade journals over a seven year period (1996-2002) found that "most of the articles were conceptual in nature..." (DeLone & McLean, 2004: 35). As a contribution towards operationalizing e-Commerce success metrics, this paper reports on an ongoing investigation into e-Commerce success factors. The paper presents a single case study of a well known South African e-Commerce venture, kalahari.net[1], which is regarded as one of the successes in the e-Commerce environment in that region (Financial Mail: 2004). In particular the case study examines the complexities involved in managing kalahari.net's information systems, and highlights a preliminary set of indicators of success of the IS function.

2. BACKGROUND TO E-BUSINESS IN SOUTH AFRICA

South Africa was not immune to the e-Commerce hype. According to the Department of Trade and Industry, expectations that the Internet would boost SA's economy and revolutionise the market by allowing small firms to compete equally with larger rivals did not materialise. The general manager of information technology and communications is quoted as saying that "Many of the initial hopes of the internet revolution have been disappointing" (Stones, 2002). As well as the disappointments of the SME sector, larger organisations which participated in the e-Commerce gold rush also ran into problems. There are many examples of this. The following are some of the well known examples in South Africa.

1. Broadcast Interactive Group, an internet venture with the backing of several radio stations, closed before it was properly off the ground.
2. In July 2001, Woza, a successful independent online content company closed down after its main investor, Bytes Technology Group pulled out – even though it claimed a page impression rate of 5.5 million a month.
3. The Shoppingmatrix.com, which set out to mainly retail DVDs and music CDs shut down after alleged cash flow problems.
4. The SPAR national supermarket chain closed down its online shopping site due to extremely poor sales via the site.
5. The banking venture Blue Bean and Twenty20 were also South African e-Commerce ventures that did not last very long (with the latter recently being relaunched).

The Department of Trade and Industry, claims that the biggest disappointment of the Internet had been its failure to empower small businesses through its capacity of allowing them to communicate more easily with customers and trading partners, and to close the gap between big and small companies. They claim that among the problems faced by start-up online companies in South Africa, businesses underestimated the necessity of having a trusted brand name to secure online sales (Stones, 2002).

A survey of online retail activity in South Africa (Goldstuck: 2002) reports that the failure rate of e-Commerce in South Africa was 35% (2000-2002) and this was predicted to grow to 40%. This survey points out that online retail in South Africa is "at a very early stage of its market penetration, and remains deeply immature in its implementation."

[1] kalahari.net® is a Trademark

Many factors contributed to the demise of the online retail market during this period. In general it can be stated that the business world underestimated the complexities and importance of many aspects of business including marketing, finance, human resources as well as not properly appreciating the challenges offered by the technology itself. Thus organisations like Boo.Com failed as much from technological and IS management blunders as it did from general business incompetence.

In light of the foregoing, research into e-Business in South Africa is timeous in assisting practitioners to obtain an understanding of the complexities surrounding this business paradigm. The author has chosen to conduct a detailed study of the well-known South African business called kalahari.net. The objective of this case study is to evaluate this organisations success and to identify some of the key characteristics of its operation which have lead to this success. Although this case study is wide ranging in scope its main thrust is related to how kalahari.net manages and evaluates its IS function.

3. RESEARCH METHODOLOGY

The approach to this case study draws mainly on interpretivist methods. Cognoscente of recent criticisms of the value of management research (Starkey & Madan: 2001) and that of the relevance of certain types of empirical research in IS (Benbasat & Zmud: 1999), the author adopted a case study approach (Yin: 1994).

The rationale of using a case study was to allow an in-depth examination of a real world problem based on an existing company already engaged in e-Commerce. Case study research according to Harrison (2002: 177) is more aptly described as a strategy than a method. It sets out to address the understanding of a phenomenon within its operating context. Of necessity, case study research is about making sense of the complexities of a real world working environment and this is the approach taken here.

The primary sources of data for the case-study were interviews with knowledgeable informants from within kalahari.net. The interviews took place during June and August 2004 and during March 2005. The interview transcripts were analysed using qualitative content analysis (Henning, 2004: 104-109) to reduce the data through a process of coding. Motivations for choosing a qualitative approach to this investigation are provided by Babbie & Mouton (1998:270).

The author made several visits to the premises of kalahari.net. In addition to this I also reviewed a number of public documents of the holding company, and carefully examined the web site. This also included registering as a customer, and making a purchase. The author also generated a "complaint" to kalahari.net's customer support section, to determine how this was handled by the system.

4. AN OVERVIEW OF kalahari.net ®

kalahari.net is a South African based business referred to by its owners and managers as an e-Tailer[2]. It is a web and Internet facilitated business which sells products such as books, CDs, DVDs, videos, software, hardware, wine, and health care goods. These products are sourced from South Africa, and elsewhere. In addition to these products kalahari.net has a number of online partners through which products such as ticketing solutions to theatres, cinemas and major events may be bought.

kalahari.net is operated as a business unit of Via Afrika which is a wholly owned subsidiary division of Naspers Limited. Naspers is listed on the Johnannesburg Stock Exchange and Nasdaq in New York. Naspers Limited, is today a R10 billion turnover enterprise and has R8 billion assets (Naspers, 2004). Via Afrika controls a number of different businesses operating as independent business units in book publishing and distribution, niche retail and entertainment, and in private education. In 1998 Naspers decided to take advantage of the opportunities offered by the Web and the Internet and launched through its subsidiary, Via Afrika, a number of internet businesses which included 24.com (now mweb.co.za), kalahari.net, fin.24.com and news24.com.

As mentioned above kalahari.net was first envisaged as a book selling business. The idea for this came from the CEO of Naspers. John van Relihan, who was responsible for Via Afrika's book club division,

[2] An e-Tailer is an online retailer... and in the B2C sector, the business model focuses on sales to the individual customer (Laudon & Traver, 2003: 71).

grabbed this opportunity. At this point they owned the largest book club in Africa. With so much publicity concerning the apparent success of Web based businesses such as Amazon.com it was thought that this could be emulated in South Africa and Via Africa could do it.

Some "venture capital" money was allocated by the holding company to fund the operation. John van Relihan set up an independent team and they began working towards the creation of an e-Commerce operation.

This was the period of extraordinary hype concerning the Web and it was generally thought that it was not difficult to set up an e-Commerce operation and that it could be achieved in a short period of time. The dictum emanating from American business schools and consultants in this period was that with as little as $50,000 and within 60 days an e-Commerce website could be up and running. This type of thinking omitted the issue of on-going costs and revenue and the breakeven period. As there was no-one in the Via Africa group with e-Commerce experience this type of exaggeration appears to have been believed.

As a result of this thinking there was virtually no preparation for kalahari.net. There was no business case prepared, although it was generally thought that a breakeven situation would be reached in two years. No rational for suggesting a period of two years to reach the breakeven point has been offered and even today after six years, breakeven has not been achieved. Furthermore there was no risk analysis performed. The development of the website was rushed and a launch took place in October 1998 approximately one month after the decision was taken to get into this business.

Not surprisingly the Website attracted little business. The problems with the first attempt to make kalahari.net an e-Business were typical of the many errors made by start up Dot.Com of that period.

The marketing plan was ill conceived. The technological issues and challenges, especially relating to information systems architecture, were not really understood. The web-site interface is described as being "horrendous", with long download times, and poor information on the site. The crucial internal data loading process took weeks and resulted in unreliable product data. There was no fulfilment process in place. The kalahari.net team was made up of three business oriented people, and approximately ten newly graduated IT students. The sourcing policy was not well thought through. The funding was not well conceived or planned – Via Africa had what they refer to as an "open book" basis for funding kalahari.net. In addition, there were inadequate internal controls with which to management the businesses.

Failure was certainly staring them in the face. The sum of the potential loss was not big in the Naspers world but the failure of an e-Commerce venture in the full light of the public media was a most unattractive prospect.

As a result of this predicament management at both kalahari.net and Via Africa decided to re-launch the business. Via Afrika appointed Susan van der Schijff who had a direct marketing background to take over the reigns at kalahari.net in March 1999. Susan had been the product developer for the book club and she had a much better understanding as to what an e-Business was about. The re-launch took place in October 1999 and in so doing the kalahari.net management ensured that:-

1. A more knowledge and experienced team was put in place. The largely inexperienced IT staff were dismissed, and a new team of only four people were recruited. This included a seasoned IT manager as well as a web-site designer.
2. The back office systems were reorganized to become more responsive to the needs of a web-facilitated business and the fulfilment processes were redesigned.
3. The web-site itself was substantially overhauled.
4. The relationships with suppliers were strengthened to ensure that more accurate product data was provided.
5. The direct marketing experience of the new general manager, was used to implement new strategies to attract and retain customers. This included diversifying the product base.

Thus, in 1999, kalahari.net was re-launched in a much more thoughtful and professional way, keeping a close watch on all the important business variables. Since the re-structure and the re-launch of

Kalahari.net the business has grown from strength to strength, as indicated by its increasing turnover shown in Figure 1.
Over the past 6 years kalahari.net has become known as one of the best recognised e-Commerce brands

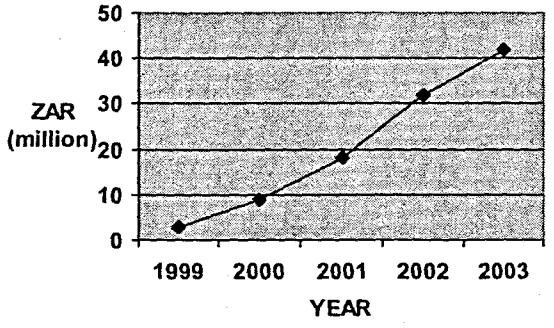


Figure 1: kalhari.net turnover

in South Africa. It is not only well established but it has become a role model in South Africa. It was recently rated as the best site (Figure 2) from among of a possible 1000 websites (including Amazon.com) in a Financial Mail survey (Financial Mail, 2004). It was identified as the subject of this study as it offers many lessons for both well established Internet facilitated business as well as for those who wish to enter this market for the first time.

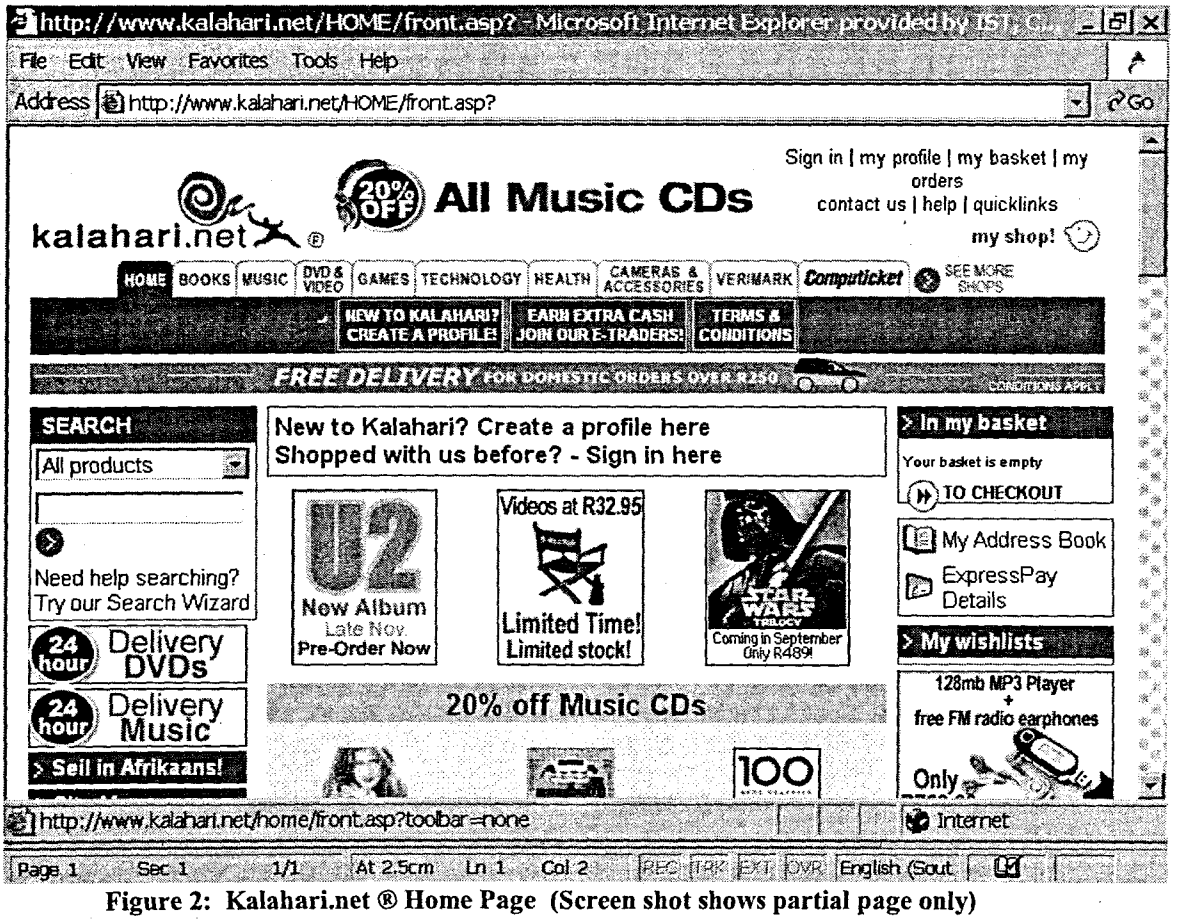


Figure 2: Kalahari.net ® Home Page (Screen shot shows partial page only)

5. AN EVALUATION OF KALAHARI.NET

As mentioned above kalahari.net is regarded as a successful e-Commerce or e-Business in South Africa. According to members of staff the reasons why kalahari.net is considered as such are:-

i. Its year on year growth;
ii. It's the biggest B2C e-Commerce website in SA;
iii. It has 200,000 registered customers;
iv. It has received accolades from the South Africa press especially the prestigious Financial Mail;
v. It has no domestic competition;
vi. It was the first e-Business to be fully compliant with the Electronic Communications and Transactions (ECT) Act;
vii. It is close to breakeven and intends to start making profits in the 2005-2006 period.

The company is regarded as a success despite the fact that it has not yet broken even. Breakeven is anticipated soon. However kalahari.net has the financial backing of a more substantive parent company which may probably be able to sustain it for quite some time if that was to become necessary. It is therefore problematical to really call kalahari.net a commercial success. It certainly is a public relations and awareness success and it is very beneficial to the Naspers Limited group to have a business which is so highly recognised in South Africa and which is so well regarded. But the objective of business is ultimately profit – or at least not making losses - and this has not yet been achieved. Therefore care needs to be taken with the use of the word success. If kalahari.net was an independent operation where the owner managers had to go to the financial market for funding it is questionable as to whether it would have survived the hiatus in the financial markets.

Our evaluation of kalahari.net is that the work of the past 5 years has positioned the business so that if the current growth performance is sustained and if costs are keep under control it will become a profit generator in the near future. But referring to kalahari.net as a business success when it has not yet reached its breakeven point after six years is not a description I would readily wish to use.

6. MEETING THE IS MANAGEMENT CHALLENGE

As mentioned above one of the major objectives of this research was to understand how kalahari.net managed the IS function (comprising 4 major systems – See Figure 3) which is regarded as a core aspect of any e-Commerce business. The interviews reveals some very interesting IS management issues. Some of these are recognised as tried and tested IS management practices, however there are some innovative ideas in use at kalahari.net as well.

Before discussing the detail of some of the management processes used by the IS function in kalahari.net it is useful to point out how critical they perceive their IS function to be for their business. Besides the fact that the website has to function without error 24/7 they also rely heavily on a wide range of other information. In the words of management,

> *"Without a database there is no website and with no website there is no business. Data is needed to allow us to feed the site. Information such as how mnay items are available on the website, what the stock availability is, our pricing, the number of days to deliver and the number of days for products to arrive are essential. We monitor the supply chain closely. Where the stock is coming from? How much is international or how much is local? The weight, the volumetric mass, delivery dates, when will the customer receive an order, how many customers did receive on time, how many did not, to mention only some of the issues."*

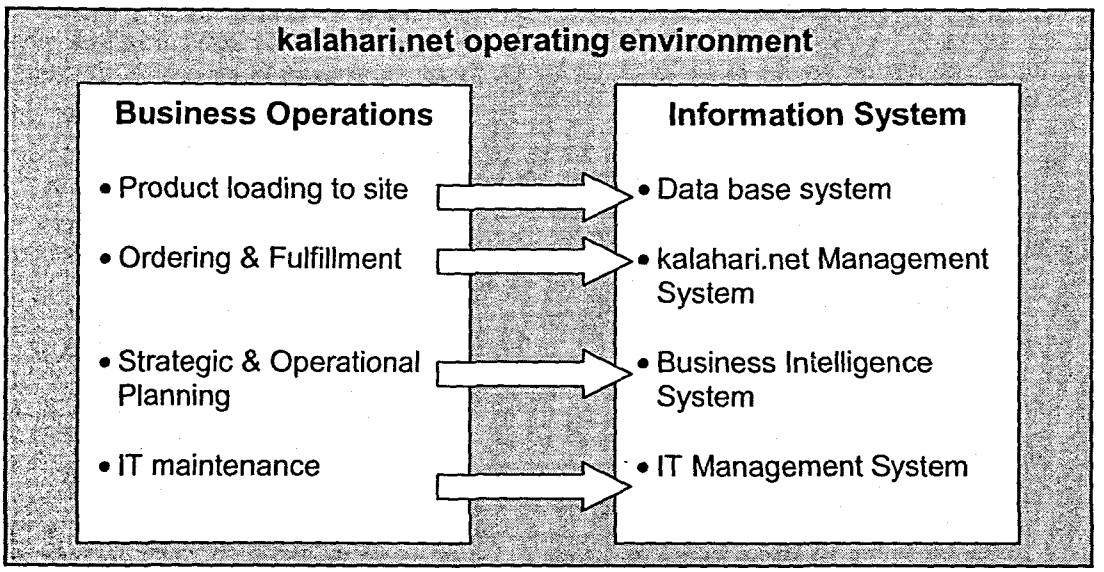


Figure 3: There are 4 central Information Systems at kalahari.net

In addition, the IS function is required to report weekly on issues such as, cash flows, order received per day, order deliveries per day, cost per order income, postage cost per order, exception reports on suppliers' costs.

There are also reports required on operational issues such as website down time, downloading of website time for customers etc. The management of kalahari.net clearly believe that their business is fuelled by information.

The following sections provide an overview of key areas of the organisation's IS management and operations. I view these as having a central role to play in achieving success with their IS.

6.1 Aligning the IT and Business Stakeholders

When the kalahari.net website initially commenced operations in 1998 the relationship between business managers and the embryonic Information Technology (IT) department was at a very low ebb. Thus in the initial period of kalahari.net's operations, the IS were plagued by serious problems such as bugs, and generally inadequate performance. This is hardly surprising when one considers the fact that the website was developed and was up and running within one month by what was in effect very young and inexperienced people.

Due to the rush to be in business the initial attitude of business managers was *"Get something going, get it on the web"*, without proper consideration as to the implications of their requests. This is clearly an unsatisfactory approach to IS. However the IS function responded as best it could by trying to implement these requests without fully understanding what was really required. This led to unsatisfactory systems which in turn resulted in distrust between the two parties and an eventual a substantial breakdown in communications.

After this rather messy start the senior management made a strategic decision to bring together in a much more functional way the business and IS stakeholders. In working towards this they firstly outsourced the IS department in total – the management of kalahari.net felt that the extra burden placed on managing IS personnel placed a burden on their abilities to keep focused on the business. In doing so, a very important condition was placed on outsourcing - the outsourced partner was required to base its personnel at kalahari.net's headquarters in Cape Town. Secondly controls embodied in IS development and maintenance methodologies were introduced for all aspects of IS work.

6.2 Maintaining the Business & IT partnership

The philosophy behind kalahari.net attitude to maintaining a sense of partnership between the business and the IS function was to ensure continuous dialogue between these two groups. This was affected through regularly scheduled meetings.

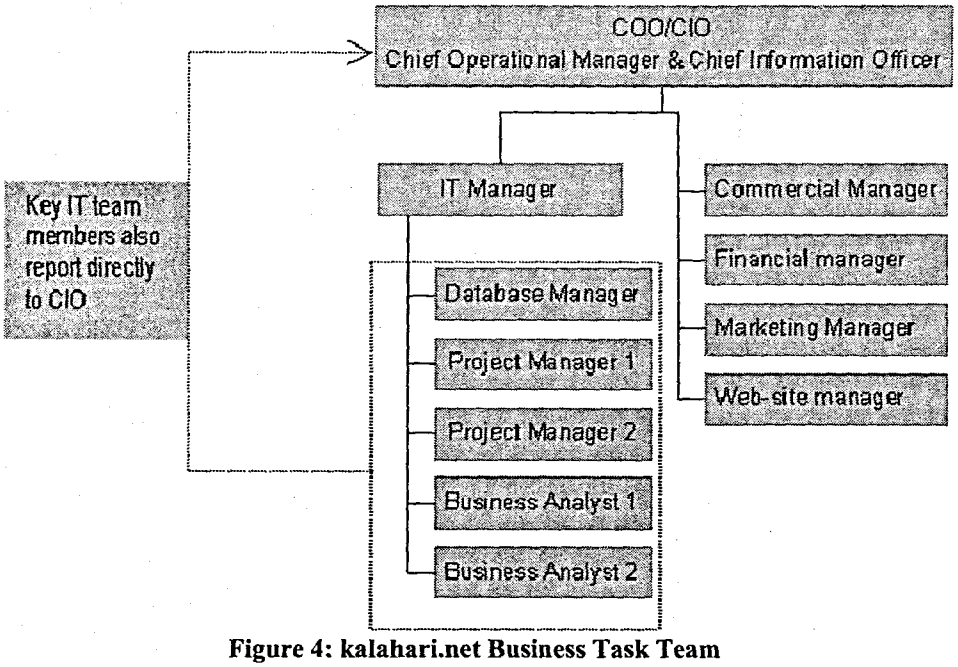


Figure 4: kalahari.net Business Task Team

The IS-Business partnership is maintained using a three-pronged strategy:
The first step in establishing this dialogue was to establish a weekly business-prioritising meeting. A task team of business stakeholders (see Figure 4) meets weekly with IT managers to address immediate, short-term and medium term priorities. These team meetings had a positive effective in fostering greater co-operation between the Business and IS, as well as between different managers of the business.

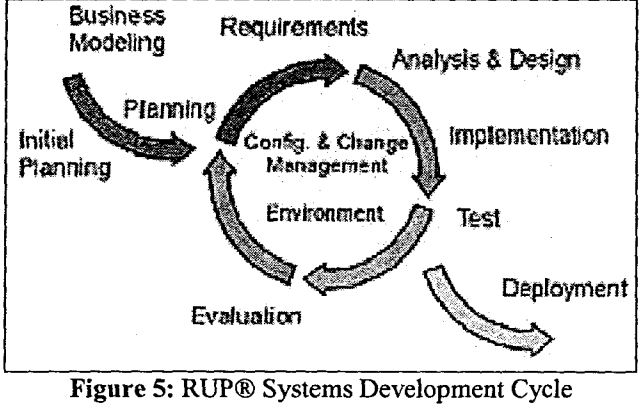


Figure 5: RUP® Systems Development Cycle
Source IBM [http://www-306.ibm.com/software/awdtools/rup/]

Secondly, attention was focused on systems development methodologies. IBM Rational Unified Process®, or RUP®, methodologies were introduced. RUP®, is a comprehensive, Web-enabled set of software engineering best practices that provide guidance for streamlining the team's activities (Kroll, 2001). Business analysts at kalahari.net have given RUP the thumbs up, and favour its ability to provide sets of project documentation that is meaningful to both IT and business stakeholders. In this way all the role-players can participate meaningfully systems development phases. As a result of the implementation of this new methodology, business stakeholders became fully involved in all phases of the systems development life cycle (see Figure 5).

Thirdly, key IT team members became involved in decision making at all levels. They are involved in making IT project decisions as well as in routine business meetings at which issues such as gross profit, budgets, turnover etc. are discussed.

6.3 Database Management is central to operations

Central to e-Tailing is the management of a large database. kalahari.net is linked to approximately 400 supplier databases all over the word – these range from 2 million products down to only 2 products. A primary kalahari.net database houses all product information (See Figure 6). Extreme care is taken to ensure the accuracy of the data. There is no room for errors e.g. a DVD that should retail for R899 should not be sold for R89.99.

Suppliers are totally responsible for providing the data to the primary databases each day. Since it is not possible to manually check such a huge stock database, exception reporting takes place to identify errors e.g. selling price is lower that the cost price.

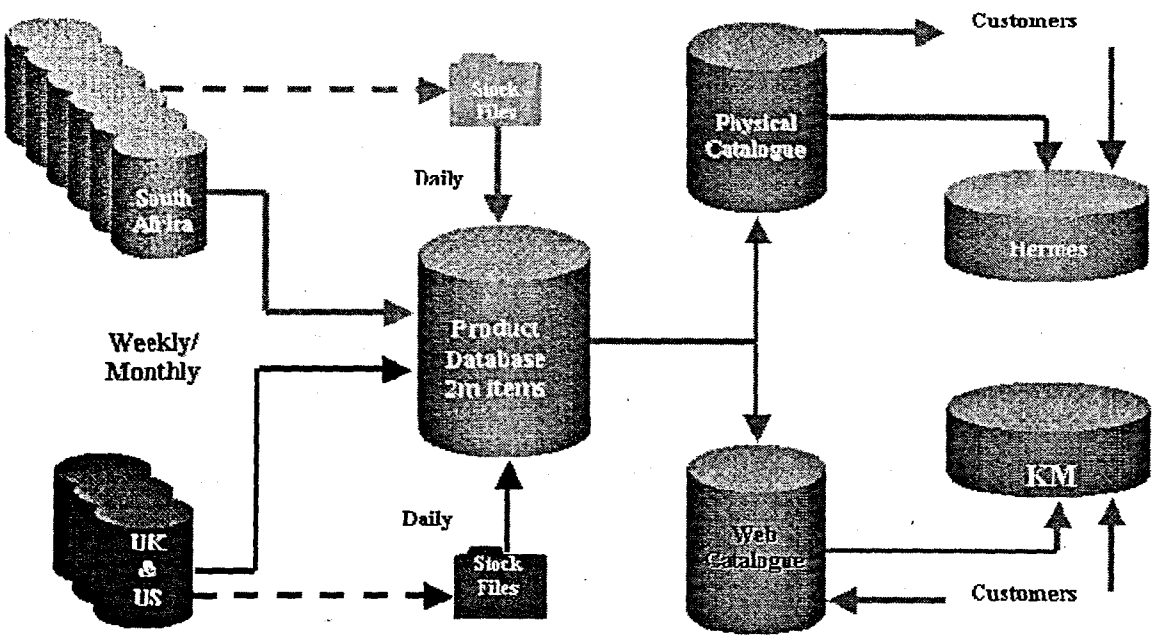


Figure 6: Ensuring suppliers update the database with accurate data is an all important business process. Source [kalahari.net®]

In addition to exception reporting, a suppliers report is maintained to determine how many suppliers have actually sent through an updated data file, at what time did the report come through, and how long did it take to upload.

6.4 Ordering & fulfilment

The kalahari.net Management System (KMS) which is essentially a CRM system handles all ordering and fulfilment processing. Central to ensuring that these key processes function smoothly, is once again, the integrity of the data being handled.

KMS is used to monitor the purchasing cycle. Orders to suppliers are compiled twice daily, and depending on the facilities available at the supplier end, these are either electronic (EDI, FTP, email) or manual (via fax). All transactional data relating to orders in the pipeline are handled by KMS. This is processed and is available as a report which gets prioritised each morning at the start of the day. Based on the data and supplier reports, customers are contacted regarding delivery of products on time. kalahari.net also utilises manual methods such as telephone or fax to verify orders to suppliers.

6.5 Efficient Delivery systems

Suppliers and couriers have deadlines and must adhere to agreed SLAs e.g. overseas suppliers have an hour after receiving a FTP file to report on fulfilment problems – thereafter they have up to 24 hours to

have products transported to a designated courier. Within 2 days the products are shipped to kalahari.net's distribution centre near Cape Town International airport. Thereafter the shipping agents at the airport have 1 day to clear customs and excise and to transport the goods to distribution centre where streamlined processes ensure minimum delays in delivery to the customer.

6.6 Essential Web-site Features

There are several key features on the Web-site that are viewed by kalahari.net's management as central to success.

The first of these is the site's search engine. The use of the search facility by a customer usually marks the commencement of a potential transaction. Consequently the search facility is continuously tested. In addition to this all searches conducted are produced as reports in order for the Marketing department to monitor the interests of shoppers.

Secondly, downloading time of the web pages is considered crucial. kalahari.net prides itself on providing its customers with a download time of 8 seconds or lower and considerable resources have been spent on design and technical infrastructure to make this a reality. Monitoring of the download time takes place through continuous testing of the loading time.

Thirdly, merchandising is viewed as being important. Quick turn around on updating stock items – IT must be able to support updating of products – they to achieve updating within 10 minutes.

Fourthly, with regards the payment gateway kalahari.net ensures that within 2 seconds a customer will receive feedback on verification of card, as well as authorisation of payment.

6.7 Business Intelligence for Management Decision making

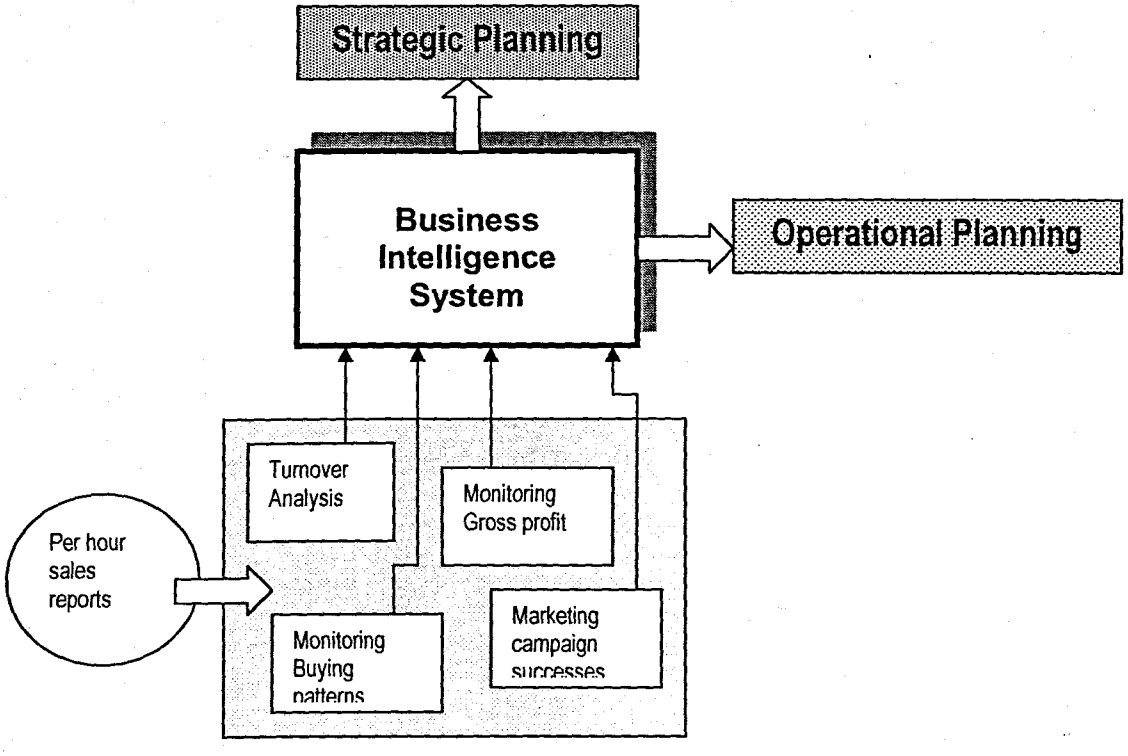


Figure 7: Business Intelligence System

At the core of both strategic and operational decision-making is a Business Intelligence System (BIS) (Figure 7). Information from BIS is used for both strategic as well as day-to-day planning. BIS is an IS responsibility with a manager assigned to the BI system reporting to the CIO.

As one of the core functionalities, the BIS provide hourly and daily sales reports, which are either used operationally or presented as detailed turnover analysis report to senior management. Turnover is also monitored per product category which can be viewed at any time of the day. This report assists in monitoring feedback on marketing, doing customer profiling, and in identifying areas in which the kalahari.net brand needs to be strengthened. Gross profit is also monitored daily in order that managers make decisions speedily when profits fall below expected margins.

6.7 Trust And Privacy

In South Africa, the Electronic Communications and Transaction (ECT) Act was promulgated in 2002. The Act introduces a number of regulations to SA's e-commerce community. Among other things, the Act provides for the protection of consumers in terms of privacy and the security of electronic payments (South Africa, 2002).

In 2002 a B2C e-Commerce Readiness Survey was conducted by South African based Buys Attorneys and Trust Online, examining the websites and legal notices of 607 South African websites. Buys and Trust Online examined legal notices, privacy policies, terms and conditions of use, disclaimers and security policies. kalahari.net was found to be the only company that was 100% compliant with the ECT Act. As a result, in August 2002, the company went public, with a claim that it was the first South African e-Tailer to be compliant with the requirements of the ECT Act and was also fully in support of the efforts made to protect the consumer (e-Strategy, 2002).

7. KEY ELEMENTS OF THE BUSINESS MODEL

kalahari.net's management is emphatic that traditional business rules apply in the way they conduct business. However they are aware of the key differences between managing a brick and mortar retailing operation and that of an e-Commerce shop front.

First and foremost a brick and mortar-retailing model is essentially a collection model – the business procures products from suppliers and the customer goes to the business to "collect" the goods. However e-Tailing is a delivery model – customers don't collect but they receive.
Secondly, e-Commerce is a direct marketing business. All direct marketing principles are applicable whereas brick and mortar use distribution marketing. This is a very critical difference to the brick and mortar environment.
Thirdly, the demand on speed in the e-Commerce environment is much greater – customers are not tolerant if products are not available in the same way that they can be with a brick and mortar business.
Fourthly packaging in e-Commerce is crucial as the business is responsible for delivery of goods.
Fifthly, the database is a major difference e.g. a brick and mortar retailer is not as concerned about customer databases in the same way as the e-Commerce business. Accurate data pertaining to delivery addresses, email addresses, correct products etc. are of paramount importance.
Lastly, a very sound relationship with suppliers is required to ensure that the suppliers understand the importance of supplying accurate product data.

8. TOWARDS AN EVALUATION OF THE IS FUNCTION

The way in which the IS function at kalahari.net evolved is interesting for several reasons.

During the initial period it appears that the IS requirement for an e-Business was substantially underestimated. Via Africa charged into this business with no real understanding of what IS infrastructure was required to create an organisation like kalari.net and to establish an industrial strength online business.

The IS team which developed the early website were clearly not adequately experienced from either a technological or from a business point of view. The comments made by kalahari.net concerning the IS function's lack of communications and understanding, although present in many organisations, seems to have been chronic in this case.

The termination of their employment and the outsourcing of the IS function seems to have been an inevitable consequence of the lack of planning undertaking in the pre-launch phase and the poor management during the first year of operation. Disposing of the IS team in this way this could not be

regarded as a sign of successful management and it is likely that it was not confidence building for the other members of the organisation either.

At the re-launch of the business there is clearly a new understanding of the role of IS in such an online retailing organisation. The IS function has effectively moved to the centre of the stage. IS is perceived as being a major focus of business attention and the IS staff is brought right into the centre of business decision-making.

The regime of regular meetings of business and IS colleagues and quick follow up of decision and solutions to problems demonstrates a whole new understanding of how to use this technology. The use of modern systems methodologies that caters for the involvement of all stakeholders is also an indication of the new attitude towards IS in the business.

The following provide some indication that in the current setup of the IS function is performing at a satisfactory level:

- There is a very small error rate recorded on the product database.
- The payment gateway, and checkout process works smoothly.
- There are a number of payment options, all of which work well. This is due also in part to a strong relationship with the relevant 3rd parties.
- The web-site was voted as the best of a 1000 sites by the public. This is an indication that it is meeting the needs of its clientele.
- The synergies between the four major IS (and their associated portfolio of applications) discussed in this paper, appears to support the attainment of the business objectives - the bottom line of which is to get closer to break-even.

Like the evaluation of the success of the kalahari.net business, in general it is too early to pronounce on the success of the IS function - but it is nonetheless easy to see a much clearer understanding of the importance of IS in their business and a much more intensive approach to integrating IS and business functions.

8.1 Future requirements

Current management of the IS infrastructure occurs on a needs basis - with the impact on turnover being the most common indicator of success/failure. I would rather suggest that the business requires an integrated assessment procedure. Such a procedure must provide a framework to evaluate the various components of the IS infrastructure, in a way that gives management the ability to monitor the impact of the technology (and thus their investment) on the attainment of specific business objectives. Such an assessment should be conducted periodically, so as to aid medium term and longer-term decision-making.

As a starting point towards an integrated assessment procedure, a summary of critical e-Commerce functions that require IS support are identified. These are presented in Figure 8. which highlights a preliminary set of IS related metrics that were identified during the investigation. These metrics are mapped onto Angehrn's ICDT model (Angehrn, 1997). The ICDT model identifies four virtual spaces on the internet (Information, Commuication, Transaction and Distribution spaces), and is one useful way of differentiating the applicability of metrics. Furthermore these four virtual spaces lend themselves to the customer buying cycle (van der Merwe & Bekker, 2003) viz. need recognition, gathering information, evaluating information, making a purchase. The organization of metrics in this way will allow kalahari.net management to monitor critical areas of the business, in terms of identified needs e.g. an increase in page hits, but decrease in purchases may prompt a closer look at items associated with the *Virtual Transaction Space.*

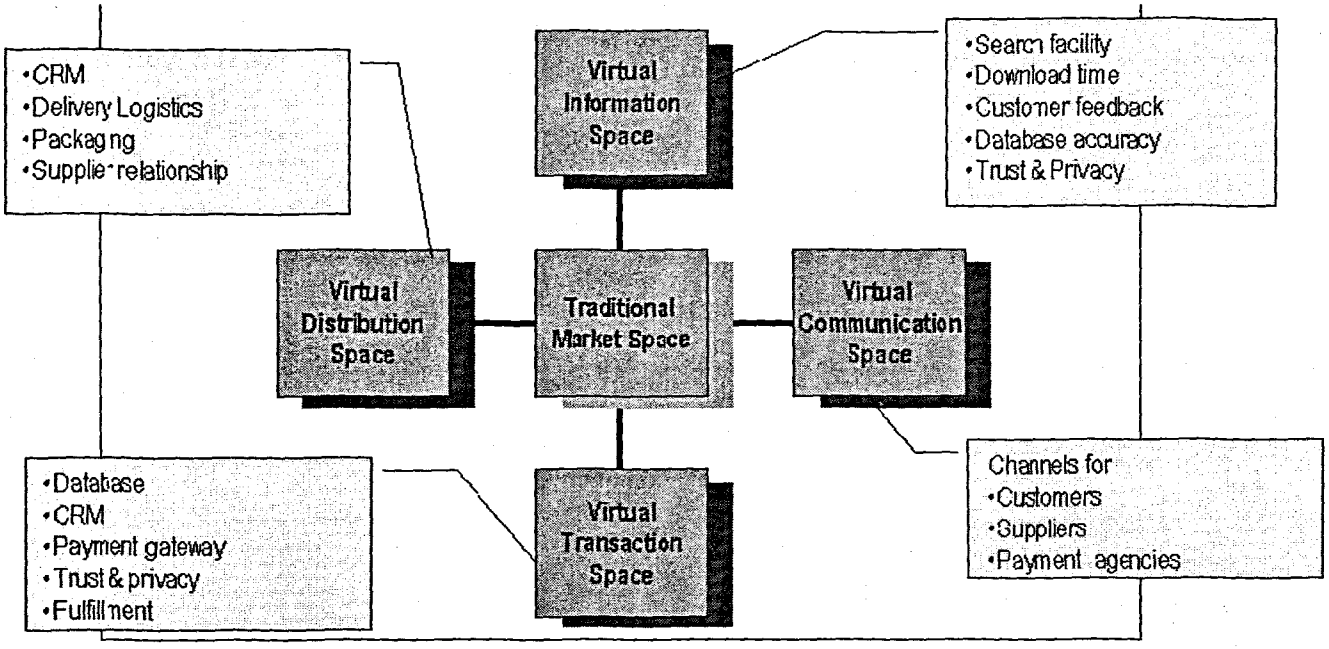


Figure 8: Preliminary Metrics for Evaluating e-Commerce Success

9. LESSONS FROM THE CASE STUDY

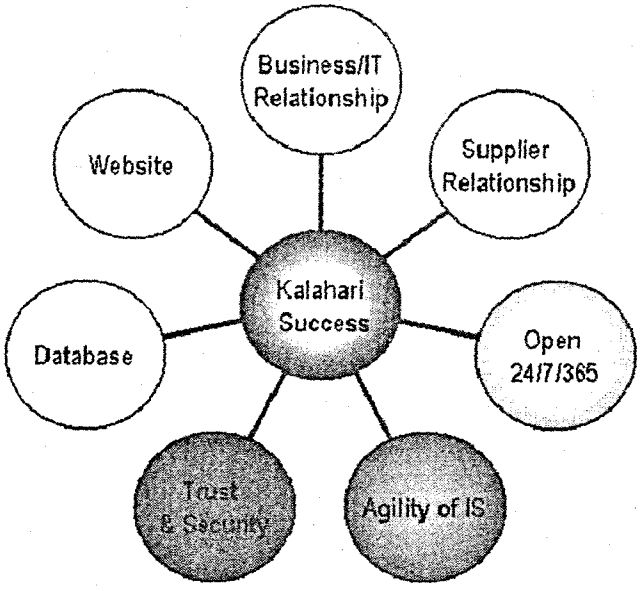
From the discussions with the management of kalahari.net it is apparent that they believe that there are several special issues on which they have to focus which are different to a traditional bricks and mortar business. These issues as well as other pertinent success criteria, highlighted in the foregoing discussion, are presented in Figure 9, as a set of critical success factors.

In particular the following areas of business operations are deemed to be critical to the success of the e-Commerce business:-

1. At all costs the electronic shop-front must be kept open and active 24/7/365 – this includes ensuring the availability of a hot-site. Site under construction notices and other distractions by which the shop-front is not available are extremely counter productive to the business. The electronic shop-front needs to be as attractive as possible and have as wide an appeal as possible.
2. Agility and flexibility - the IS infrastructure must allow for the business to be agile in responding to product updates to the web-site, advertising of specials etc. Changes have to be made immediately. Any substantial lead-time involved represents lost revenues.
3. An effective, efficient, database infrastructure is essential for a successful online retailing business. An on-line shop lives by its twin databases. These are the product database which represents the inventory in the shop front and needs to be both up-to-date and error free and the client database which represents the main market opportunities. The product database needs to be seamlessly connected to the procurement and delivery systems to ensure that the correct items are delivered on time.

4. IT and business stakeholders need to think together, and engage in joint decision making across all areas of business – including "non-IT" issues. There is just no room for a "culture-gap".

Figure 9: Critical Success Factors of the business



5. Make every effort to ensure the privacy of customer data. In the e-Tailing environment, the volume of successful transactions, is directly dependent on the trust the customers have in your systems' ability to offer secure transactions.
6. The web-site requires: minimum download time, accurate and smooth searching facilities, minimal click through rates, a quick payment facility, pre-orders facilities for purchasing of products prior to product launch, and visible security features. The electronic shop-front needs to centre around the customer.

10. CONCLUSION

this paper has described a South African e-Business operating in the B2C environment. A set of preliminary metrics for evaluation, as well as Critical Success factors, has been identified. The key aspects of the findings of the case study indicate a few important lessons regarding both the management of IS and that of the business. In addition to the lessons already outlined, the following need to be highlighted:

- One of the key issues relating to the creation, deployment, and maintenance of IS infrastructure in an e-Business relates to the relationship between business and IT stakeholders. The case study demonstrates that e-Business requires the bringing together of these stakeholders in not only the day-to-day management of the business, but also in key-decision making structures. Furthermore, the utilisation of systems development methodologies that are friendly to all stakeholders has been shown to be a contributory factor to this relationship.
- The use of a modern IT management tool is crucial to keeping the IS infrastructure functioning. Systems need to be monitored vigilantly, and have to be kept as lean as possible to ensure reduced workloads on both systems and people.

- Business is business, be it electronic or brick and mortar. However, the common element is the financial statements. Money does count, and kalhari.net has demonstrated that all eyes are on problems that directly affect turnover and gross-profit. Indeed these are monitored and reported daily, and business reacts with agility, if either of these are not meeting targets. The company's information system is always the first stop in reacting to a falling bottom line.
- In the electronic on-line trading environment, database technology is the most central aspect of the IS infrastructure. Extreme care, and diligence is taken to ensure that product data, and customer data,

is accurate. There is no room for errors, and successful transactions depends entirely on the way in which this is managed.

It is not my intention to offer these findings as generalizations for the e-Business sector in South Africa, and elsewhere, but rather to offer these findings as an initial set of criteria that could be used to adapt business models, and improve management practice. Many of the issues raised are mostly pertinent to the B2C environment, but issues around procurement of goods are important to the B2B sector as well.

Future work includes, further investigation and collection of empirical evidence of e-Commerce success metrics in order to verify and extend those identified; comparison of findings in this case study to others; and the development of more comprehensive framework for measuring the performance of IS in e-Commerce businesses.

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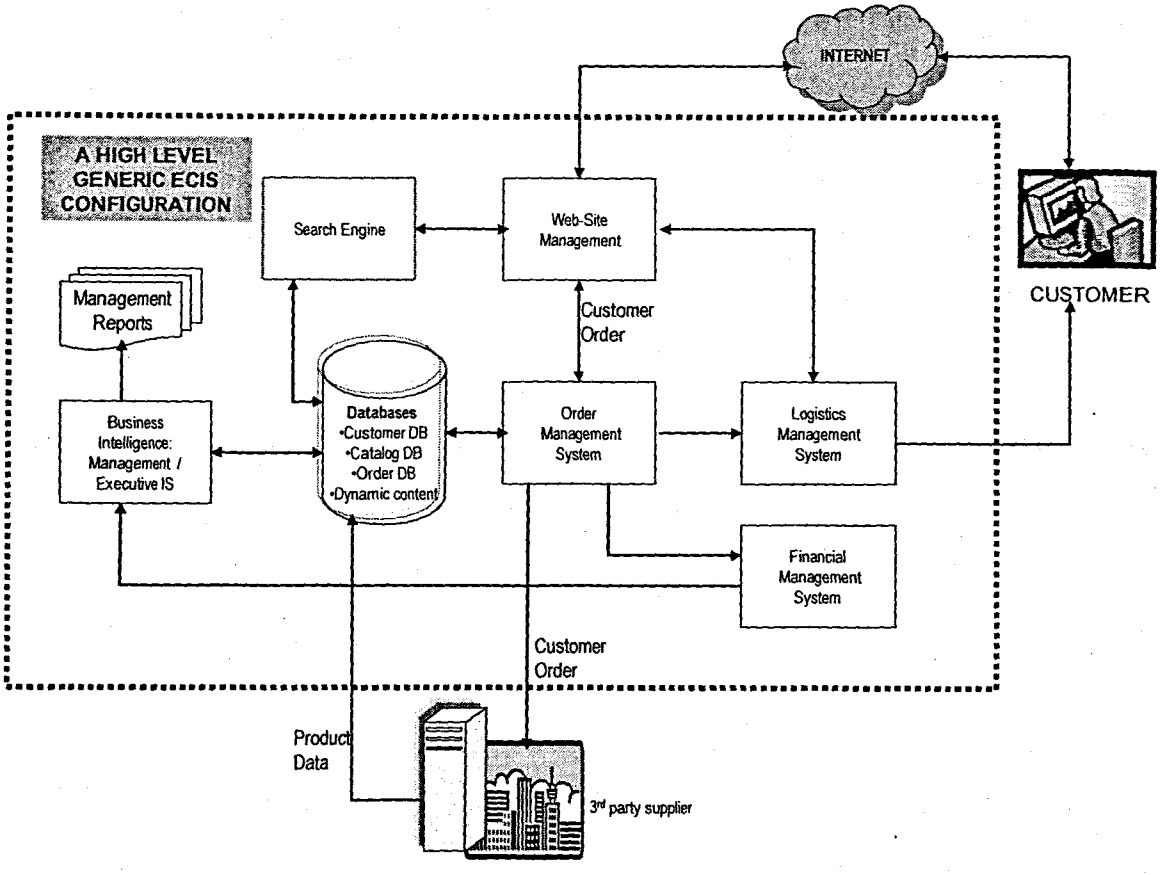
A GENERIC CONFIGURATION OF ECIS



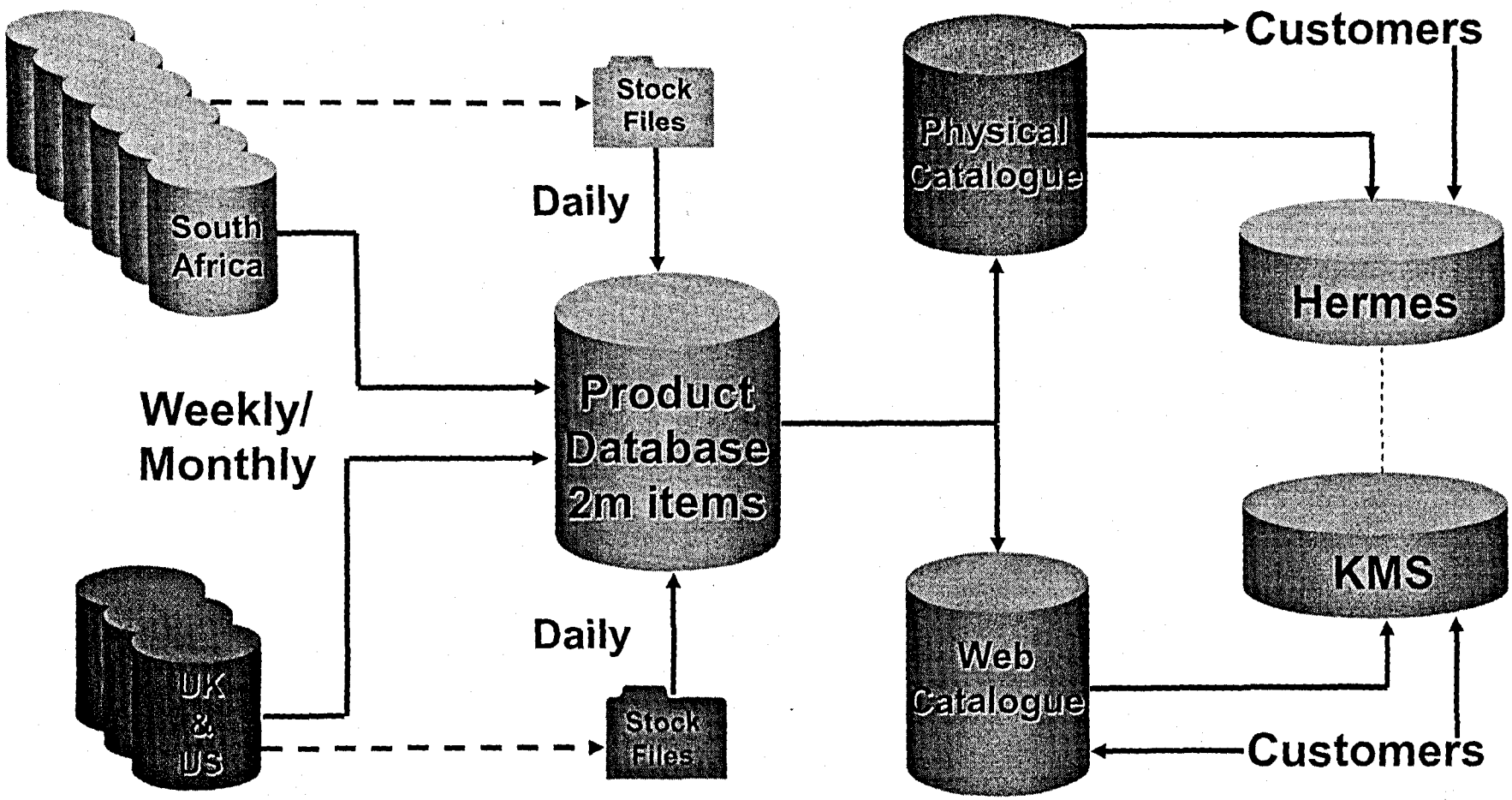
A Generic Configuration of ECIS infrastructure

The elements represented in this configuration are:

- *Web-interface*: Represents all elements on the business web-site which, depending on complexity of the online offering, could represent more than a hundred different web pages.
- *Search-engine:* The search engine is specifically represented here as it has been identified as an important ECIS component that is used by customers to search for product items when shopping. It is represented by a dotted-box, as data is only processed by the search engine if it deals with a product query from the web-site. In all other instance, data flows directly between the databases and the web-interface to the client computer of the customer.

- *Databases:* There are usually a number of different databases, depending on the needs of the business. Commonly used databases include the customer database (customer personal data); Catalogue database (details of the products on offer); Order database (details of active, as well as completed orders); Dynamic content (content of web-pages including text, images, banners, sound etc.).
- *Order management system:* This system manages customer orders that are placed via the web-site and is used to track the status of orders, support post-transaction queries by customers, and provide shipping details to the logistics management system.
- *Logistics management system:* This system manages the picking, packaging and delivery of orders to the customer.
- *Business intelligence systems*: Business intelligence systems include Management and/or Executive Information systems. These systems are used to analyse information in the database, and provide reports to managers for tactical and strategic decision making.
- *Financial management system:* This system keeps track of income and expenditure, and provides financial reporting to managers.

Core : Centralized Database



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(8 5) /KEY IS FUNCTIONS OR CHARACTERISTICS/CRM system	(8 5)	10/04/2006	01:36:04	20/05/2006	19:15:48	No	5809	15
(8 6) /KEY IS FUNCTIONS OR CHARACTERISTICS/Data quality	(8 6)	10/04/2006	01:49:03	20/05/2006	19:15:48	No	12716	32
(8 7) /KEY IS FUNCTIONS OR CHARACTERISTICS/Controls	(8 7)	10/04/2006	01:49:46	20/05/2006	19:15:48	No	2357	11
(8 8) /KEY IS FUNCTIONS OR CHARACTERISTICS/Evaluation d	(8 8)	12/04/2006	23:44:42	20/05/2006	19:15:48	No	5195	23
(8 9) /KEY IS FUNCTIONS OR CHARACTERISTICS/Updating DB	(8 9)	16/04/2006	14:16:11	20/05/2006	19:15:48	No	11809	42
(8 10) /KEY IS FUNCTIONS OR CHARACTERISTICS/Payment ga	(8 10)	18/04/2006	09:49:10	20/05/2006	19:15:48	No	1061	2
(8 11) /KEY IS FUNCTIONS OR CHARACTERISTICS/Site visibilit	(8 11)	20/04/2006	23:31:41	20/05/2006	19:15:48	No	2469	10
(8 12) /KEY IS FUNCTIONS OR CHARACTERISTICS/Remote ma	(8 12)	23/04/2006	00:44:27	20/05/2006	19:15:48	No	4903	17
(8 13) /KEY IS FUNCTIONS OR CHARACTERISTICS/Search Eng	(8 13)	24/04/2006	09:08:44	20/05/2006	19:15:48	No	3304	13
(8 14) /KEY IS FUNCTIONS OR CHARACTERISTICS/IS Integratic	(8 14)	24/04/2006	10:02:27	20/05/2006	19:15:48	No	8937	28
(8 15) /KEY IS FUNCTIONS OR CHARACTERISTICS/Speed	(8 15)	25/04/2006	13:30:40	20/05/2006	19:15:48	No	1486	7
(8 16) /KEY IS FUNCTIONS OR CHARACTERISTICS/Fulfillment	(8 16)	26/04/2006	11:01:35	20/05/2006	19:15:48	No	8209	20
(8 17) /KEY IS FUNCTIONS OR CHARACTERISTICS/Keep look a	(8 17)	02/05/2006	10:20:53	20/05/2006	19:15:48	No	475	3
(8 18) /KEY IS FUNCTIONS OR CHARACTERISTICS/Channels fc	(8 18)	02/05/2006	15:21:14	20/05/2006	19:15:48	No	1329	3
(9) /BUSINESS MANAGEMENT	-9	03/04/2006	12:48:58	20/05/2006	19:25:47	No	1504	6
(9 1) /BUSINESS MANAGEMENT/Disaster Recovery Plans	(9 1)	03/04/2006	18:34:14	20/05/2006	19:25:47	No	202	1
(9 2) /BUSINESS MANAGEMENT/Top Mng Support	(9 2)	20/04/2006	23:15:40	20/05/2006	19:25:47	No	1333	7
(9 3) /BUSINESS MANAGEMENT/Business Principles Apply	(9 3)	04/04/2006	08:37:24	20/05/2006	19:25:47	No	8339	35
(9 3 1) /BUSINESS MANAGEMENT/Business Principles Apply/Rol	(9 3 1)	06/04/2006	14:04:27	20/05/2006	19:25:47	No	3753	9
(9 3 2) /BUSINESS MANAGEMENT/Business Principles Apply/Ma	(9 3 2)	06/04/2006	14:22:39	20/05/2006	19:25:47	No	3366	14
(9 4) /BUSINESS MANAGEMENT/Business Strategy drives IS stra	(9 4)	04/04/2006	08:45:37	20/05/2006	19:25:47	No	7732	22
(9 5) /BUSINESS MANAGEMENT/Change Management	(9 5)	04/04/2006	10:39:01	20/05/2006	19:25:47	No	2614	5
(9 6) /BUSINESS MANAGEMENT/Strong Business Model Reqd~	(9 6)	10/04/2006	00:24:16	20/05/2006	19:25:47	No	12840	33
(9 6 1) /BUSINESS MANAGEMENT/Strong Business Model Reqd~	(9 6 1)	10/04/2006	00:25:50	20/05/2006	19:25:47	No	4191	20
(9 7) /BUSINESS MANAGEMENT/Marketing	(9 7)	10/04/2006	00:29:53	20/05/2006	19:25:47	No	10639	51
(9 8) /BUSINESS MANAGEMENT/Strong Business Experience	(9 8)	16/04/2006	10:28:14	20/05/2006	19:25:47	No	3174	11
(9 9) /BUSINESS MANAGEMENT/Daily management	(9 9)	24/04/2006	10:49:07	20/05/2006	19:25:47	No	4941	16
(9 10) /BUSINESS MANAGEMENT/Procurement of goods	(9 10)	06/04/2006	18:29:30	17/05/2006	00:39:09	No	12450	21
(9 11) /BUSINESS MANAGEMENT/Project Management	(9 11)	19/04/2006	18:58:59	20/05/2006	19:25:47	No	914	2

NVIVO REPORT: ALL NODES DATA TABLE

NODE	Tree Addre	Creation Date	Creation Ti	Modification Date	Modification Time	Is Extract?	Characters Coded	Paragraphs Coded
(9 12) /BUSINESS MANAGEMENT/Lack of IS knowledge	(9 12)	23/04/2006	00:39:18	20/05/2006	19:25:47	No	10190	29
(9 13) /BUSINESS MANAGEMENT/Management Reports	(9 13)	24/04/2006	12:12:07	20/05/2006	19:25:47	No	3303	9
(9 14) /BUSINESS MANAGEMENT/Manage environmental factors	(9 14)	27/04/2006	21:12:46	20/05/2006	19:25:47	No	2885	4
(10) /IS Management	-10	10/04/2006	02:05:22	20/05/2006	19:44:49	No	3757	21
(10 1) /IS Management/System Maintainance	(10 1)	20/04/2006	07:11:32	20/05/2006	19:44:49	No	7996	21
(10 2) /IS Management/disaster recovery	(10 2)	20/04/2006	12:47:26	20/05/2006	19:44:49	No	3048	9
(10 3) /IS Management/Managing Projects	(10 3)	04/05/2006	23:55:51	20/05/2006	19:44:49	No	3295	10
(10 4) /IS Management/IS Staff turnover	(10 4)	23/04/2006	00:41:22	20/05/2006	19:44:49	No	2627	7
(10 5) /IS Management/Knowledgeable about business	(10 5)	26/04/2006	10:51:05	20/05/2006	19:44:49	No	1523	5
(11) /BUSINESS BENEFITS of ECommerce	-11	18/04/2006	09:36:47	10/05/2006	07:12:47	No	2036	5
(12) /Search Results	-12	20/05/2006	19:45:19	20/05/2006	19:45:19	No	0	0
(12 1) /Search Results/Single Node Lookup	(12 1)	20/05/2006	19:45:19	20/05/2006	19:45:19	No	1151	5
(12 2) /Search Results/Single Node Lookup 2	(12 2)	20/05/2006	19:46:33	20/05/2006	19:46:33	No	1398	4
(12 3) /Search Results/Single Node Lookup 3	(12 3)	20/05/2006	19:47:39	20/05/2006	19:47:39	No	75	2

NVIVO REPORT: ALL NODES DATA TABLE

NODE	Documents Coded	Passages Coded	Memos Linked To	Other Docs Linked To	Extracts Linked To	Other Nodes Linked To
B2B	3	4	0	0	0	0
Believes they are NOT successful	1	2	0	0	0	0
Believes they are successful	7	8	0	0	0	0
CSFs	4	12	0	0	0	0
don't outsource core competencies	2	2	0	0	0	0
EBusiness Hype	9	11	0	0	0	0
ISP	1	1	0	0	0	0
Market Equilibrium	1	2	0	0	0	0
Various	3	4	0	0	0	0
(1) /High Costs	16	37	0	0	0	0
(2) /IS Development	7	11	0	0	0	0
(2 1) /IS Development/Driven by business	17	26	0	0	0	0
(2 2) /IS Development/Methodology	8	13	0	0	0	0
(2 3) /IS Development/Prototyping	2	2	0	0	0	0
(2 4) /IS Development/Easy to create a web-site	4	7	0	0	0	0
(2 5) /IS Development/In-house development	3	6	0	0	0	0
(2 6) /IS Development/Outsourced development	17	28	0	0	0	0
(2 7) /IS Development/Testing	6	9	0	0	0	0
(2 8) /IS Development/build vs buy	5	8	0	0	0	0
(2 9) /IS Development/IS Planning	6	8	0	0	0	0
(2 9 1) /IS Development/IS Planning/Customer levels of IT literacy	6	7	0	0	0	0
(2 9 2) /IS Development/IS Planning/Document business expectatic	4	11	0	0	0	0
(2 9 4) /IS Development/IS Planning/Risk assessment	8	12	0	0	0	0
(2 9 5) /IS Development/IS Planning/System Architecture	4	8	0	0	0	0
(2 9 6) /IS Development/IS Planning/Document business processes	4	5	0	0	0	0
(2 17) /IS Development/Compatibility	2	2	0	0	0	0
(3) /HIGH RELIANCE ON IS	7	14	0	0	0	0
(4) /AGILITY & INNOVATIVENESS	20	48	0	0	0	0
(5) /BUSINESS & IS RELATIONSHIP	10	18	0	0	0	0
(5 1) /BUSINESS & IS RELATIONSHIP/Turnaround time	5	5	0	0	0	0
(5 2) /BUSINESS & IS RELATIONSHIP/Service Level Agreements	9	18	0	0	0	0
(5 3) /BUSINESS & IS RELATIONSHIP/Different perspectives	8	12	0	0	0	0
(5 4) /BUSINESS & IS RELATIONSHIP/Business takes responsibil	13	23	0	0	0	0
(5 5) /BUSINESS & IS RELATIONSHIP/Importance of joint team	22	49	0	0	0	0
(6) /CUSTOMER-FOCUSED & E-SERVICE QUALITY	27	115	0	0	0	0
(7) /IS EVALUATION	15	37	0	0	0	0
(7 1) /IS EVALUATION/Measurement of financial expenditure	7	17	0	0	0	0
(7 3) /IS EVALUATION/Measure against initial expectations	2	2	0	0	0	0
(7 4) /IS EVALUATION/Test Software	5	6	0	0	0	0
(7 6) /IS EVALUATION/Measuring Business value	19	33	0	0	0	0
(7 8) /IS EVALUATION/System Quality	3	5	0	0	0	0
(7 9) /IS EVALUATION/Monitor turnover	17	35	0	0	0	0
(7 10) /IS EVALUATION/Informal eval	10	19	0	0	0	0
(7 11) /IS EVALUATION/Site hit rate	11	18	0	0	0	0
(7 12) /IS EVALUATION/business & IS have different perspec	7	12	0	0	0	0
(7 13) /IS EVALUATION/Conversion Rate	3	3	0	0	0	0

NVIVO REPORT: ALL NODES DATA TABLE

NODE	Documents Coded	Passages Coded	Memos Linked To	Other Docs Linked To	Extracts Linked To	Other Nodes Linked To
(7 14) /IS EVALUATION/Measure Non-IS issues	2	4	0	0	0	0
(7 15) /IS EVALUATION/Exception Reporting	1	2	0	0	0	0
(7 16) /IS EVALUATION/Customer-Feedback	2	2	0	0	0	0
(7 16 1) /IS EVALUATION/Customer-Feedback/Formal feedback	11	13	0	0	0	0
(7 16 2) /IS EVALUATION/Customer-Feedback/Informal feedback	10	13	0	0	0	0
(7 17) /IS EVALUATION/Web-site usage data	11	16	0	0	0	0
(7 18) /IS EVALUATION/no evaluation procedures	5	6	0	0	0	0
(8) /KEY IS FUNCTIONS OR CHARACTERISTICS	1	1	0	0	0	0
(8 1) /KEY IS FUNCTIONS OR CHARACTERISTICS/IS links with	10	20	0	0	0	0
(8 2) /KEY IS FUNCTIONS OR CHARACTERISTICS/Security	11	16	0	0	0	0
(8 3) /KEY IS FUNCTIONS OR CHARACTERISTICS/Web-interfac	8	17	0	0	0	0
(8 3 1) /KEY IS FUNCTIONS OR CHARACTERISTICS/Web-interf	7	7	0	0	0	0
(8 3 2) /KEY IS FUNCTIONS OR CHARACTERISTICS/Web-interf	14	21	0	0	0	0
(8 3 3) /KEY IS FUNCTIONS OR CHARACTERISTICS/Web-interf	5	7	0	0	0	0
(8 3 4) /KEY IS FUNCTIONS OR CHARACTERISTICS/Web-interf	5	7	0	0	0	0
(8 3 5) /KEY IS FUNCTIONS OR CHARACTERISTICS/Web-interf	5	7	0	0	0	0
(8 4) /KEY IS FUNCTIONS OR CHARACTERISTICS/Site Availibili	6	7	0	0	0	0
(8 5) /KEY IS FUNCTIONS OR CHARACTERISTICS/CRM system	8	14	0	0	0	0
(8 6) /KEY IS FUNCTIONS OR CHARACTERISTICS/Data quality	11	30	0	0	0	0
(8 7) /KEY IS FUNCTIONS OR CHARACTERISTICS/Controls	4	4	0	0	0	0
(8 8) /KEY IS FUNCTIONS OR CHARACTERISTICS/Evaluation d	8	14	0	0	0	0
(8 9) /KEY IS FUNCTIONS OR CHARACTERISTICS/Updating DB	13	34	0	0	0	0
(8 10) /KEY IS FUNCTIONS OR CHARACTERISTICS/Payment ge	2	2	0	0	0	0
(8 11) /KEY IS FUNCTIONS OR CHARACTERISTICS/Site visibilit	9	10	0	0	0	0
(8 12) /KEY IS FUNCTIONS OR CHARACTERISTICS/Remote ma	4	13	0	0	0	0
(8 13) /KEY IS FUNCTIONS OR CHARACTERISTICS/Search Eng	3	8	0	0	0	0
(8 14) /KEY IS FUNCTIONS OR CHARACTERISTICS/IS Integratic	8	19	0	0	0	0
(8 15) /KEY IS FUNCTIONS OR CHARACTERISTICS/Speed	5	7	0	0	0	0
(8 16) /KEY IS FUNCTIONS OR CHARACTERISTICS/Fulfillment	7	15	0	0	0	0
(8 17) /KEY IS FUNCTIONS OR CHARACTERISTICS/Keep look a	2	2	0	0	0	0
(8 18) /KEY IS FUNCTIONS OR CHARACTERISTICS/Channels fo	2	3	0	0	0	0
(9) /BUSINESS MANAGEMENT	4	5	0	0	0	0
(9 1) /BUSINESS MANAGEMENT/Disaster Recovery Plans	1	1	0	0	0	0
(9 2) /BUSINESS MANAGEMENT/Top Mng Support	5	6	0	0	0	0
(9 3) /BUSINESS MANAGEMENT/Business Principles Apply	18	28	0	0	0	0
(9 3 1) /BUSINESS MANAGEMENT/Business Principles Apply/Rol	5	10	0	0	0	0
(9 3 2) /BUSINESS MANAGEMENT/Business Principles Apply/Ma	7	11	0	0	0	0
(9 4) /BUSINESS MANAGEMENT/Business Strategy drives IS stra	10	20	0	0	0	0
(9 5) /BUSINESS MANAGEMENT/Change Management	3	6	0	0	0	0
(9 6) /BUSINESS MANAGEMENT/Strong Business Model Reqd~	17	32	0	0	0	0
(9 6 1) /BUSINESS MANAGEMENT/Strong Business Model Reqd~	10	11	0	0	0	0
(9 7) /BUSINESS MANAGEMENT/Marketing	16	32	0	0	0	0
(9 8) /BUSINESS MANAGEMENT/Strong Business Experience	6	9	0	0	0	0
(9 9) /BUSINESS MANAGEMENT/Daily management	8	16	0	0	0	0
(9 10) /BUSINESS MANAGEMENT/Procurement of goods	10	21	0	0	0	0
(9 11) /BUSINESS MANAGEMENT/Project Management	2	3	0	0	0	0

NVIVO REPORT: ALL NODES DATA TABLE

NODE	Documents Coded	Passages Coded	Memos Linked To	Other Docs Linked To	Extracts Linked To	Other Nodes Linked To
(9 12) /BUSINESS MANAGEMENT/Lack of IS knowledge	9	21	0	0	0	0
(9 13) /BUSINESS MANAGEMENT/Management Reports	2	8	0	0	0	0
(9 14) /BUSINESS MANAGEMENT/Manage environmental factors	4	4	0	0	0	0
(10) /IS Management	6	13	0	0	0	0
(10 1) /IS Management/System Maintainance	7	18	0	0	0	0
(10 2) /IS Management/disaster recovery	6	8	0	0	0	0
(10 3) /IS Management/Managing Projects	3	8	0	0	0	0
(10 4) /IS Management/IS Staff turnover	4	5	0	0	0	0
(10 5) /IS Management/Knowledgeable about business	3	4	0	0	0	0
(11) /BUSINESS BENEFITS of ECommerce	4	6	0	0	0	0
(12) /Search Results	0	0	0	0	0	0
(12 1) /Search Results/Single Node Lookup	2	3	0	0	0	0
(12 2) /Search Results/Single Node Lookup 2	3	4	0	0	0	0
(12 3) /Search Results/Single Node Lookup 3	2	2	0	0	0	0

NVIVO REPORT: ALL NODES DATA TABLE

NODE	Sets The Node Belongs To
B2B	0
Believes they are NOT successful	0
Believes they are successful	0
CSFs	0
don't outsource core competencies	0
EBusiness Hype	0
ISP	0
Market Equilibrium	0
Various	0
(1) /High Costs	2
(2) /IS Development	1
(2 1) /IS Development/Driven by business	2
(2 2) /IS Development/Methodology	2
(2 3) /IS Development/Prototyping	2
(2 4) /IS Development/Easy to create a web-site	2
(2 5) /IS Development/In-house development	2
(2 6) /IS Development/Outsourced development	2
(2 7) /IS Development/Testing	2
(2 8) /IS Development/build vs buy	2
(2 9) /IS Development/IS Planning	2
(2 9 1) /IS Development/IS Planning/Customer levels of IT literacy	2
(2 9 2) /IS Development/IS Planning/Document business expectatic	2
(2 9 4) /IS Development/IS Planning/Risk assessment	2
(2 9 5) /IS Development/IS Planning/System Architecture	2
(2 9 6) /IS Development/IS Planning/Document business processes	2
(2 17) /IS Development/Compatibility	2
(3) /HIGH RELIANCE ON IS	2
(4) /AGILITY & INNOVATIVENESS	2
(5) /BUSINESS & IS RELATIONSHIP	2
(5 1) /BUSINESS & IS RELATIONSHIP/Turnaround time	2
(5 2) /BUSINESS & IS RELATIONSHIP/Service Level Agreements	2
(5 3) /BUSINESS & IS RELATIONSHIP/Different perspectives	2
(5 4) /BUSINESS & IS RELATIONSHIP/Business takes responsibil	2
(5 5) /BUSINESS & IS RELATIONSHIP/Importance of joint team	2
(6) /CUSTOMER-FOCUSED & E-SERVICE QUALITY	0
(7) /IS EVALUATION	2
(7 1) /IS EVALUATION/Measurement of financial expenditure	2
(7 3) /IS EVALUATION/Measure against initial expectations	2
(7 4) /IS EVALUATION/Test Software	2
(7 6) /IS EVALUATION/Measuring Business value	2
(7 8) /IS EVALUATION/System Quality	2
(7 9) /IS EVALUATION/Monitor turnover	2
(7 10) /IS EVALUATION/Informal eval	2
(7 11) /IS EVALUATION/Site hit rate	2
(7 12) /IS EVALUATION/business & IS have different perspec	2
(7 13) /IS EVALUATION/Conversion Rate	2

NVIVO REPORT: ALL NODES DATA TABLE

NODE	Sets The Node Belongs To
(7 14) /IS EVALUATION/Measure Non-IS issues	2
(7 15) /IS EVALUATION/Exception Reporting	2
(7 16) /IS EVALUATION/Customer-Feedback	2
(7 16 1) /IS EVALUATION/Customer-Feedback/Formal feedback	1
(7 16 2) /IS EVALUATION/Customer-Feedback/Informal feedback	1
(7 17) /IS EVALUATION/Web-site usage data	2
(7 18) /IS EVALUATION/no evaluation procedures	2
(8) /KEY IS FUNCTIONS OR CHARACTERISTICS	2
(8 1) /KEY IS FUNCTIONS OR CHARACTERISTICS/IS links with	2
(8 2) /KEY IS FUNCTIONS OR CHARACTERISTICS/Security	2
(8 3) /KEY IS FUNCTIONS OR CHARACTERISTICS/Web-interfac	2
(8 3 1) /KEY IS FUNCTIONS OR CHARACTERISTICS/Web-interf	2
(8 3 2) /KEY IS FUNCTIONS OR CHARACTERISTICS/Web-interf	2
(8 3 3) /KEY IS FUNCTIONS OR CHARACTERISTICS/Web-interf	2
(8 3 4) /KEY IS FUNCTIONS OR CHARACTERISTICS/Web-interf	2
(8 3 5) /KEY IS FUNCTIONS OR CHARACTERISTICS/Web-interf	2
(8 4) /KEY IS FUNCTIONS OR CHARACTERISTICS/Site Availibili	2
(8 5) /KEY IS FUNCTIONS OR CHARACTERISTICS/CRM system	2
(8 6) /KEY IS FUNCTIONS OR CHARACTERISTICS/Data quality	2
(8 7) /KEY IS FUNCTIONS OR CHARACTERISTICS/Controls	2
(8 8) /KEY IS FUNCTIONS OR CHARACTERISTICS/Evaluation d	2
(8 9) /KEY IS FUNCTIONS OR CHARACTERISTICS/Updating DB	2
(8 10) /KEY IS FUNCTIONS OR CHARACTERISTICS/Payment ge	2
(8 11) /KEY IS FUNCTIONS OR CHARACTERISTICS/Site visibilit	2
(8 12) /KEY IS FUNCTIONS OR CHARACTERISTICS/Remote ma	2
(8 13) /KEY IS FUNCTIONS OR CHARACTERISTICS/Search Eng	2
(8 14) /KEY IS FUNCTIONS OR CHARACTERISTICS/IS Integratic	2
(8 15) /KEY IS FUNCTIONS OR CHARACTERISTICS/Speed	2
(8 16) /KEY IS FUNCTIONS OR CHARACTERISTICS/Fulfillment	2
(8 17) /KEY IS FUNCTIONS OR CHARACTERISTICS/Keep look a	2
(8 18) /KEY IS FUNCTIONS OR CHARACTERISTICS/Channels fo	2
(9) /BUSINESS MANAGEMENT	2
(9 1) /BUSINESS MANAGEMENT/Disaster Recovery Plans	2
(9 2) /BUSINESS MANAGEMENT/Top Mng Support	2
(9 3) /BUSINESS MANAGEMENT/Business Principles Apply	2
(9 3 1) /BUSINESS MANAGEMENT/Business Principles Apply/Rol	2
(9 3 2) /BUSINESS MANAGEMENT/Business Principles Apply/Ma	2
(9 4) /BUSINESS MANAGEMENT/Business Strategy drives IS stra	2
(9 5) /BUSINESS MANAGEMENT/Change Management	2
(9 6) /BUSINESS MANAGEMENT/Strong Business Model Reqd~	2
(9 6 1) /BUSINESS MANAGEMENT/Strong Business Model Reqd~	2
(9 7) /BUSINESS MANAGEMENT/Marketing	2
(9 8) /BUSINESS MANAGEMENT/Strong Business Experience	2
(9 9) /BUSINESS MANAGEMENT/Daily management	2
(9 10) /BUSINESS MANAGEMENT/Procurement of goods	2
(9 11) /BUSINESS MANAGEMENT/Project Management	2

NVIVO REPORT: ALL NODES DATA TABLE

NODE	Sets The Node Belongs To
(9 12) /BUSINESS MANAGEMENT/Lack of IS knowledge	2
(9 13) /BUSINESS MANAGEMENT/Management Reports	2
(9 14) /BUSINESS MANAGEMENT/Manage environmental factors	2
(10) /IS Management	2
(10 1) /IS Management/System Maintainance	2
(10 2) /IS Management/disaster recovery	2
(10 3) /IS Management/Managing Projects	2
(10 4) /IS Management/IS Staff turnover	2
(10 5) /IS Management/Knowledgeable about business	2
(11) /BUSINESS BENEFITS of ECommerce	1
(12) /Search Results	0
(12 1) /Search Results/Single Node Lookup	0
(12 2) /Search Results/Single Node Lookup 2	0
(12 3) /Search Results/Single Node Lookup 3	0

NVivo revision 2.0.163 Licensee: Shaun Pather

Project: Doctorate1_V3 User: Administrator Date: 02/12/2006 - 22:31:10

NODE LISTING

Nodes in Set: All Nodes
Created: 20/05/2006 - 23:14:52
Modified: 20/05/2006 - 23:14:52
Number of Nodes: 106

1 B2B
2 Believes they are NOT successful
3 Believes they are successful
4 CSFs
5 don't outsource core competencies
Description:
large business that have the IT/Is skills prefer to have control over IS infrastrucutre that is directly related to "core competencies"

6 EBusiness Hype
7 ISP
8 Market Equilibrium
9 Various
10 (1) /High Costs
11 (2) /IS Development
12 (2 1) /IS Development/Driven by business
13 (2 2) /IS Development/Methodology
14 (2 3) /IS Development/Prototyping
15 (2 4) /IS Development/Easy to create a web-site
Description:
Creation of web-sites is relatively easy. This does not imply that business success is easy.

16 (2 5) /IS Development/In-house development
17 (2 6) /IS Development/Outsourced development
18 (2 7) /IS Development/Testing
19 (2 8) /IS Development/build vs buy
Description:
Buying systems is preferred to building systems. Perhaps this augers for a less complicated managements for business stakeholders?

20 (2 9) /IS Development/IS Planning
21 (2 9 1) /IS Development/IS Planning/Customer levels of IT literacy
22 (2 9 2) /IS Development/IS Planning/Document business expectations
23 (2 9 4) /IS Development/IS Planning/Risk assessment
24 (2 9 5) /IS Development/IS Planning/System Architecture
25 (2 9 6) /IS Development/IS Planning/Document business processes
26 (2 17) /IS Development/Compatibility
27 (3) /HIGH RELIANCE ON IS
Description:
Code nodes in this tree, to demonstrate the integral role IS palys in e-Commerce - especially the higher reliance of business on IS as compared to brick & mortar setups.

28 (4) /AGILITY & INNOVATIVENESS
Description:
Code nodes in this tree, to demonstrate:
1. that IS has to be constantly evolving and responsive - to keep up with the high demands the e-Commerce places on IS. This also is related to "SYSTEM DESIGN & WEB DESIGN" issues.
2. That both Business and IS management also have to be agile and innovative" in the way in which they manage.

29 (5) /BUSINESS & IS RELATIONSHIP
Description:

Code nodes in this tree, to demonstrate issues pertaining to the relationships between the actors involved in the management of Business and Information Systems. What are the crucial issues pertaining to how this relationship is conducted that impact on the success of IS?

30 (5 1) /BUSINESS & IS RELATIONSHIP/Turnaround time
31 (5 2) /BUSINESS & IS RELATIONSHIP/Service Level Agreements
32 (5 3) /BUSINESS & IS RELATIONSHIP/Different perspectives
33 (5 4) /BUSINESS & IS RELATIONSHIP/Business takes responsibility for IS
34 (5 5) /BUSINESS & IS RELATIONSHIP/Importance of joint team
35 (6) /CUSTOMER-FOCUSED & E-SERVICE QUALITY
Description:
Code nodes in this tree to highlight the importance respondents attach to being customer focused - also implying the critical role "e-Service Quality" plays. This is also possible a CENTRAL THEME - with all other themes being linked to this. It is possible that all IS success issues emanate from here or could be linked to this theme.

36 (7) /IS EVALUATION
Description:
code to this tree all IS evaluaton issues. IS evaluation per se may not be a IS success issue. However, integral to ensuring IS success is evaluation methods... Code any items pertianing to IS evaluation here -and reorganize at the end of analysis.

37 (7 1) /IS EVALUATION/Measurement of financial expenditure
38 (7 3) /IS EVALUATION/Measure against initial expectations
Description:
Post implementatio nevaluatio nshould be measured against initial expectations as docuemented during systems planning.

39 (7 4) /IS EVALUATION/Test Software
40 (7 6) /IS EVALUATION/Measuring Business value
Description:
An imporatn question is how does the IS contribute towards business value

41 (7 8) /IS EVALUATION/System Quality
42 (7 9) /IS EVALUATION/Monitor turnover
43 (7 10) /IS EVALUATION/Informal eval
44 (7 11) /IS EVALUATION/Site hit rate
45 (7 12) /IS EVALUATION/business & IS have different perspec
Description:
Business & IS/IT stakeholders have different perspectives on what are the success drivers in e-Commerce business. This difference is an imortant one, since evaluation muct encompass both views.

46 (7 13) /IS EVALUATION/Conversion Rate
47 (7 14) /IS EVALUATION/Measure Non-IS issues
48 (7 15) /IS EVALUATION/Exception Reporting
49 (7 16) /IS EVALUATION/Customer-Feedback
50 (7 16 1) /IS EVALUATION/Customer-Feedback/Formal feedback
51 (7 16 2) /IS EVALUATION/Customer-Feedback/Informal feedback
52 (7 17) /IS EVALUATION/Web-site usage data
53 (7 18) /IS EVALUATION/no evaluation procedures
Description:
The business has no particular tools being used to measure success.

54 (8) /KEY IS FUNCTIONS OR CHARACTERISTICS
Description:
How does IS contribute to successful e-Commerce? Those key IS functions that are possible "non-negotiables" must be indentified.

55 (8 1) /KEY IS FUNCTIONS OR CHARACTERISTICS/IS links with suppliers
56 (8 2) /KEY IS FUNCTIONS OR CHARACTERISTICS/Security
57 (8 3) /KEY IS FUNCTIONS OR CHARACTERISTICS/Web-interface

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       58     (8 3 1) /KEY IS FUNCTIONS OR CHARACTERISTICS/Web-interface/Web Content
       59     (8 3 2) /KEY IS FUNCTIONS OR CHARACTERISTICS/Web-interface/User-
Friendly
       60     (8 3 3) /KEY IS FUNCTIONS OR CHARACTERISTICS/Web-interface/Branding
       61     (8 3 4) /KEY IS FUNCTIONS OR CHARACTERISTICS/Web-
interface/Personalisation
       62     (8 3 5) /KEY IS FUNCTIONS OR CHARACTERISTICS/Web-interface/Trust
       63     (8 4) /KEY IS FUNCTIONS OR CHARACTERISTICS/Site Availibility
       64     (8 5) /KEY IS FUNCTIONS OR CHARACTERISTICS/CRM system
       65     (8 6) /KEY IS FUNCTIONS OR CHARACTERISTICS/Data quality
       66     (8 7) /KEY IS FUNCTIONS OR CHARACTERISTICS/Controls
       67     (8 8) /KEY IS FUNCTIONS OR CHARACTERISTICS/Evaluation data
       68     (8 9) /KEY IS FUNCTIONS OR CHARACTERISTICS/Updating DBase
       69     (8 10) /KEY IS FUNCTIONS OR CHARACTERISTICS/Payment gateway
       70     (8 11) /KEY IS FUNCTIONS OR CHARACTERISTICS/Site visibility
       71     (8 12) /KEY IS FUNCTIONS OR CHARACTERISTICS/Remote management of Web
       72     (8 13) /KEY IS FUNCTIONS OR CHARACTERISTICS/Search Engine
       73     (8 14) /KEY IS FUNCTIONS OR CHARACTERISTICS/IS Integration
       74     (8 15) /KEY IS FUNCTIONS OR CHARACTERISTICS/Speed
       75     (8 16) /KEY IS FUNCTIONS OR CHARACTERISTICS/Fulfillment
       76     (8 17) /KEY IS FUNCTIONS OR CHARACTERISTICS/Keep look and feel
constant
       77     (8 18) /KEY IS FUNCTIONS OR CHARACTERISTICS/Channels for human touch
       78     (9) /BUSINESS MANAGEMENT
       Description:
Code at this tree those crucial management SKILLS that lend itself to successful IS
OR
Identify specific management related ISSUES that pertain to successful IS.

       79     (9 1) /BUSINESS MANAGEMENT/Disaster Recovery Plans
       80     (9 2) /BUSINESS MANAGEMENT/Top Mng Support
       81     (9 3) /BUSINESS MANAGEMENT/Business Principles Apply
       Description:
To deomnstrate that business principles are more important the the IS - and that
poor buisness processes are more likely to lead to e-Commerc efailure as compared
to poor IS.

       82     (9 3 1) /BUSINESS MANAGEMENT/Business Principles Apply/Robust business
processes
       83     (9 3 2) /BUSINESS MANAGEMENT/Business Principles Apply/Market analysis
       84     (9 4) /BUSINESS MANAGEMENT/Business Strategy drives IS strategy
       85     (9 5) /BUSINESS MANAGEMENT/Change Management
       86     (9 6) /BUSINESS MANAGEMENT/Strong Business Model Reqd~
       87     (9 6 1) /BUSINESS MANAGEMENT/Strong Business Model Reqd~/Type of
Product
       88     (9 7) /BUSINESS MANAGEMENT/Marketing
       89     (9 8) /BUSINESS MANAGEMENT/Strong Business Experience
       90     (9 9) /BUSINESS MANAGEMENT/Daily management
       91     (9 10) /BUSINESS MANAGEMENT/Procurement of goods
       92     (9 11) /BUSINESS MANAGEMENT/Project Management
       93     (9 12) /BUSINESS MANAGEMENT/Lack of IS knowledge
       94     (9 13) /BUSINESS MANAGEMENT/Management Reports
       Description:
Code at this node, managemetn reports that are required.  Items coded here will
also refer to the kind of data that the IS needs to be able to produce (or
evaluation data).  Data produced in reports allow the manager to make business
decisions  - and also evaluate the IS.

       95     (9 14) /BUSINESS MANAGEMENT/Manage environmental factors
       96     (10) /IS Management
       97     (10 1) /IS Management/System Maintainance
       98     (10 2) /IS Management/disaster recovery
       99     (10 3) /IS Management/Managing Projects
       100    (10 4) /IS Management/IS Staff turnover
       101    (10 5) /IS Management/Knowledgeable about business
       102    (11) /BUSINESS BENEFITS of ECommerce
       103    (12) /Search Results
       104    (12 1) /Search Results/Single Node Lookup
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Description:
Node lookup: text coded by the node '/CUSTOMER-FOCUSED & E-SERVICE QUALITY'

Scope: { /IS Management/disaster recovery, /IS Management, /IS Management/IS Staff turnover, /IS Management/Knowledgeable about business, /IS Management/Managing Projects, /IS Management/System Maintainance }

Result is a node coding all the finds: (12 1) /Search Results/Single Node Lookup (n)
Document finds are spread to (no spread). Node finds are spread to (no spread).

105 (12 2) /Search Results/Single Node Lookup 2
Description:
Node lookup: text coded by the node '/CUSTOMER-FOCUSED & E-SERVICE QUALITY'

Scope: { /AGILITY & INNOVATIVENESS }

Result is a node coding all the finds: (12 1) /Search Results/Single Node Lookup (n)
Document finds are spread to (no spread). Node finds are spread to (no spread).

106 (12 3) /Search Results/Single Node Lookup 3
Description:
Node lookup: text coded by the node '/CUSTOMER-FOCUSED & E-SERVICE QUALITY'

Scope: { /HIGH RELIANCE ON IS }

Result is a node coding all the finds: (12 1) /Search Results/Single Node Lookup (n)
Document finds are spread to (no spread). Node finds are spread to (no spread).