

IT VALUE IN CONTEXT

1. Introduction

The business environment of the late 20th century and the start of the 21st century is highly competitive and turbulent. Advances in Information Technology (IT) is one of the key drivers for this turbulence and competitiveness. IT also has the potential to enable companies to successfully survive and compete in this environment. As a result, investment levels in IT have increased significantly.

The combination of IT's potential as a competitive resource and the high levels of IT investment, have put IT under the management spotlight. Senior executives want to know the payback of their investments in IT and they want to link new IT investments to improved business performance.

Attempts to prove or demonstrate the link between IT investment and business performance have produced mixed results. Many of these managers are, consequently, dissatisfied with explanations of IT value. This is emerging as a key issue for managers for mainly two reasons. Firstly due to their need to know how effective they are in leveraging their existing IT investments and secondly because they need to make decisions about further investments in IT.

The purpose of Chapter One is to introduce this study about the issue of IT value. The chapter starts with an overview of the business environment, followed by advances in IT as a primary driver of the turbulence and competitiveness of the business environment and then a description of IT's role in contemporary organisations. These discussions will provide a

context for the research problem to be presented and discussed in Chapter Two. Chapter One will conclude with an outline of the overall structure of this research document.

2. The business environment today is characterised by turbulence and intense competition

A quotation by Stewart Thomas in *Fortune* of 13 December 1993 illustrates the turbulence and competitiveness of the business environment:

“We sense that the changes surrounding us are not mere trends but the workings of large, unruly forces: the globalisation of markets; the spread of information technology and computer networks; the dismantling of hierarchy, the structure that has essentially organized work since the mid-19th century. Growing up around these is a new information-age economy, whose fundamental sources of wealth are knowledge and communication rather than natural resources and physical labor.”

Manning (1998: 50 - 51) refers to the Industrial Age giving way to the Information Age. Knowledge workers are in the ascendance and most executives are unsure about how to move from the past to the future. Business managers face many challenges: socio-political and economic uncertainties; escalating competition with many of the new players being more aggressive and innovative. Another challenge is the increase in the rate, scope and complexity of changes. The power of consumers, workers and other stakeholders (e.g. environmentalists) are further rising. Lastly, technology is transforming the way products and services are created, delivered and bought as well as the way in which organisations work.

Scott Morton outlines basically the same perspective, i.e., the business environment is and will remain chaotic (Scott Morton, 1991: 3). Organisations need to contend with social, political and technological changes which are compelling organisations to transform. Madnick (1991: 29-30) continues along the same line, by stating that four business forces impact on organisations in the 1990s. There is the increased growth in globalisation where the scope of businesses will expand beyond their traditional geographical boundaries. Multi-national firms will have a heightened need to closely coordinate their various parts for maximum impact. As a result of globalisation, worldwide competition is on the rise. The number of competitors a business must face in each market place and geographic region, have increased substantially. Established businesses thus face increased pressure. To seize globalisation opportunities and to cope with heightened competition, companies are pursuing higher levels of productivity. Efforts to improve productivity are, however, constrained by the volatile and unpredictable environment. The latter is not only the result of globalisation and competition, but also of governmental, social and legal changes.

Gibson (1997: 1-13) remarks that the world of business is characterised by intense competition and rapid changes. This presents a serious challenge to business management.

“Essentially, competing for the future means maintaining continuity by ensuring that the company is constantly creating new sources of profit. ... It is about creating a virtuous cycle in the organisation, where you are continuously inventing new businesses, new sources of profit, and you are also continuously increasing the capacity for

leverage and profitability within existing businesses ...” Prahalad (1997: 63-64).

Senge (1997: 129) observes: *“The first step is to realise that everything is interrelated. That the world is becoming more inter-connected and inter-dependent, and that business is becoming more complex and dynamic.”*

Gibson (1997: 6) states also ... *“As our world becomes more complex and interdependent, change becomes increasingly non-linear, discontinuous and unpredictable.”*

Pellissier (2000, 22) mentions a number of drivers for the turbulence and competitiveness in the business environment. The drivers include changes in the global market (mainly through new technology), government-driven changes in the form of deregulation and privatisation in the South African context, the changing face of competition, and the changing pattern of employment. A further driver is the rise of knowledge as the key economic resource (mainly through technology). Pellissier (2000: 22) states, however, that the real engine that drives the digital era is technology. The impact of technological changes will be considered next.

3. Advances in IT are a major cause of the turbulent and competitive business environment

Information technology has been singled out as one of the major drivers of the turbulent and competitive business environment. Scott Morton (1991: 4) predicted that in the 1990s, organisations will experience the effects of the integration and evolution of a set of elements collectively termed IT. Scott Morton maintains that IT is made up from six elements, namely, (computer) hardware, software, networks, workstations, robotics and smart chips.

Technological progress, maintains Senge (1997: 125), adds to complexity and causes the process of change to speed up, while Davidson *et al* (1997: 29) observe that technology is changing the way we do business. Computer technology is incorporated more and more into all aspects of business, for instance, processes are reviewed and refined to take advantage of the technology, to eliminate redundancies and inefficiencies and to create new capabilities. Davenport and Short (1990: 11) refer to IT, i.e. the capabilities offered by computers, software applications and telecommunications, as one of two new tools for transforming organisations in the 1990s. Barret *et al* (1996: 42) comment that it is widely accepted that IT is a key factor in the major social transformation taking place in the late 20th century.

The technological environment has undergone some major changes and a number of key issues have emerged from these changes. The issues are: a distributed computing environment (in contrast to a largely centralised mainframe environment); new software development methods; the emergence of new technologies like object orientation, image processing, multi-media, wireless communication and the World Wide Web (WWW). The IT industry has expanded to include not only suppliers of hardware and software, but also systems integration; facilities management and information brokers. The IT industry is characterised, almost daily, by new product announcements and breakthroughs, new entrants and new alliances. A last issue flowing from the changed IT industry is the availability of external IT suppliers. Outsourcing is on the mind of many executives who want to cut costs or who want to change the IT function (Rockart *et al*, 1996: 45 – 46).

These impacts of technological advances are largely due to the economics of IT. The economics of IT have changed both absolutely and rapidly. Absolutely, in the sense that IT's cost-performance ratios continue to change by between 20 and 30% per year. The economics of IT is changing relatively in the sense that the cost of IT relative to the cost of other types of investment is widening. It is therefore relatively cheaper to invest in IT than in other forms of capital (Scott Morton, 1991: 9) as demonstrated in Table 1.1 below.

Table 1.1 Computing Cost-Performance Trends			
Constant Functionality	4.5 MIPS*	4.5 MIPS	4.5 MIPS
<i>Cost</i>			
Original projection (1981)	\$4.5 m	\$300,00	
Modified projection (1988)	--	\$100,00	\$10,000
<i>Number of people of equivalent cost</i>			
Original projection (1981)	210	6	
Modified projection (1988)	--	2	0.125

*MIPS = million instructions per second

The advances in IT have added to the complexity of IT. Parker and Benson (1988: 1-2) mention that twenty years ago, management could define computer costs and benefits with relative ease. Computer systems mostly had the aim to reduce costs. IT (computer) investment decision-makers have thus only to consider questions like: "Will an investment of \$1000 produce savings of more than \$1000?" Nowadays, technological changes and expanded management expectations have made both costs and benefits more difficult to define. IT advances have created more complexity, which makes it more difficult in turn to specify or establish IT costs as well as to identify and track benefits. IT is, however, not only a driver of change. Organisations are using IT to cope with change.

The advances in IT have various *change* implications for organisations, for instance, changes in the skills required of their employees as well as new capabilities and competencies that an organisation must manage. Further implications include altered interfaces between an organisation and its customers and suppliers as well as changes in the production of services and goods (Davidson *et al*, 1997: 90). *“Like the automobile, the computer is not one thing. It has more than one effect. It is transforming your job, your business, your markets and all of society.”* (Davidson *et al*, 1997:15).

As mentioned earlier, IT is more than a driver of the turbulent and competitive business environment. IT is also a key means for organisations to cope with these challenges and changes.

4. IT, today, is a significant business resource

Organisations are finding it difficult to cope with the change and complexity arising from the business environment and advances in IT. There is a whole new class of problems for which organisations are not prepared. Business organisations need to develop fundamentally new capabilities for understanding and re-aligning with complexity (Senge, 1997: 127).

The effective use of IT in today’s competitive business world as an element of a competitive strategy is critical. IT is an essential factor in the capability of a company to respond to other sources of change (Henderson, 1990: 7 and Parker and Benson, 1988: 26). *“As managers experience more volatile marketplaces, global competition, shortened product life cycles, customer pressures for tailored offerings and tighter*

performance standards, they increasingly depend on new information systems.” (Feeney and Willcocks, 1998: 90).

Technology has become a significant enabler of business strategies. Swift (1992: 37) states that:

“You can’t effectively exploit IT without a clear understanding and articulation of the strategies of the business and its organisation and a complete alignment of IS/IT with business strategies.

You won’t recognise the potential of opportunities offered by IT without an awareness of its capability, potential application and investment justification in the context of the above and without keeping up-to-date on relevant developments.”

McCardis (2000: 1) says that the following are different implications:

In view of IT’s significance as a competitive resource, many organisations are already highly dependent on IT (Willcocks, 1994: 2). IT forms the backbone of today’s organisation, where it has the purpose to improve both business performance and the capabilities of the organisation (Davidson *et al*, 1997: 62, 89). Willcocks (1994: 2) maintains that how IT is applied, can have massive implications for an organisation, e.g., how the organisation can function; how it can be structured; and what it can achieve.

have completely changed markets and business systems in the last

The use of IT has, in view of its potential as a business resource, increased substantially. Throughout the second half of the 20th century, IT has permeated almost all parts of modern society. It is now nearly impossible to isolate the impact of a computing investment (Davidson *et al*, 1997: 26). Renkema (2000: 3) suggests that we are at the start of a radical digitalisation of business activities. Organisations will become more and more dependent on IT in their search for corporate success and survival.

Long-term and capital-intensive business investments are made to increase effectiveness, to gain and sustain competitive advantage and to transform business processes. IT has become a critical business asset.

Since IT is constantly advancing and the demand for IT is constantly growing, organisations must regularly assess new technologies and ways to implement them (Davidson *et al*, 1997: 25). *“Nowadays, it is not so much the question of whether to invest, but more the question of how and where to invest in order to get maximum business value and to increase return on investment.”* (Renkema, 2000: 4).

The importance of IT as a competitive business resource has increased even further with the advent of the Internet. For instance, Patel and McCarthy (2000: 6) say that the Internet has different implications for companies that plan to engage in business-to-consumer marketing and sales than it does for those who use it for business-to-business purposes. All companies share, nonetheless, the Internet’s inclination for keeping communication and transaction costs low. The value of the Internet (also referred to as the Web) lies in its capacity to provide immediate access to information (Shapiro and Varian, 1999: 9).

CSC (2000: 2-3) states that history is rife with disruptive technologies that have completely changed marketplaces and refers to the Internet as a rapidly changing disruptive technology. The Internet and in particular the World Wide Web, has far-reaching implications that include:

- Enabling organisations to operate in ‘ultra-real time’, i.e., the business knows to the second exactly where it stands;
- Initiating the ‘extended’ enterprise’, an enterprise of enterprises that makes markets more efficient;

- Fostering a wide range of business strategies that leverage information assets and capabilities;
- Creating a new and fully interactive channel for business-to-consumer and business-to-business commerce;
- Re-defining customer service and enabling shifts in the customer-supplier relationship and what it means to get closer to the customer; as well as
- Opening the free flow of information within and between organisations.

The influence of the Internet will only get stronger as more organisations and individuals discover novel ways of using it (CSC, 2000: 3). There is often reference to an Internet revolution: *“We are in the midst of an Internet Revolution that will have an impact as big, if not bigger, than the Industrial Revolution. Today’s revolution is leveling the playing field and creating unprecedented opportunities for countries, companies, and individuals around the world. The result is an economy in which agility and the ability to adapt to change, not size, geographic location, or physical assets are the keys to success and survival.*

In just five years since the introduction of the World Wide Web, the Internet economy already rivals the size of century-old sectors such as energy, automotive and telecommunications. Milestones that took up to 100 years to achieve in the Industrial Age are occurring at a staggering pace in this new economy.

It is increasingly evident that the adoption of Internet applications is the key to future growth. The countries and companies that will survive are those that learn to harness the power of the Internet to create competitive

advantage.” (John Chambers, President and CEO, Cisco Systems, Inc. April 2000 in Patel and McCarthy, 2000: ix – x).

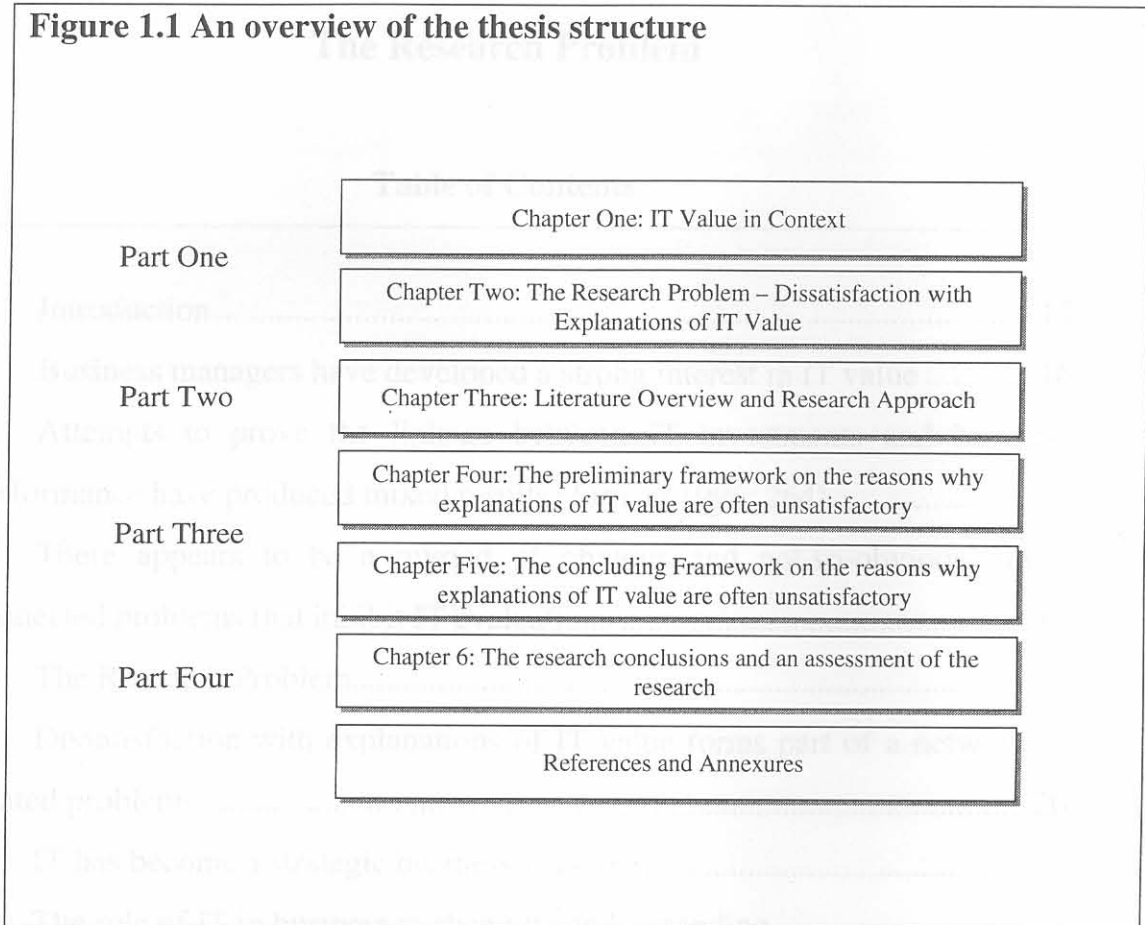
The turbulent and competitive business environment of today was discussed in the preceding part of the chapter. Advances in IT are to a large degree contributing to the turbulence and competitiveness. IT is also proving to be a key business resource for competing and surviving in this business environment. The remainder of Chapter One presents the overall structure of the thesis.

5. The structure of the thesis

The thesis has begun by developing the broad context for the research and proceeds to discuss the research problem in this context. With the research problem defined, a literature study has been conducted to assess approaches relevant to the research problem. This enabled the research objective and a set of more specific research questions to be formulated. The research methodology is then discussed.

The thesis covers two more main areas. The first concerns the application of the research methodology in pursuit of the research objective. The last part of the thesis covers the major findings, conclusions and an assessment of the research results.

An overview of the structure of the thesis is presented in Figure 1.1 on the next page.

Figure 1.1 An overview of the thesis structure

The broad phenomenon to be researched, i.e., the value of IT was contextualised in this chapter. The specific research problem will be presented and discussed in detail in Chapter 2. Chapter 2 will also show and discuss how the general problem of dissatisfaction with explanations of IT value is part of a complex and seemingly unstructured network of related issues. Chapter 2 further presents the specific research question that will form the focus of the research.