

**Towards Understanding Information Technology  
Contribution in South African  
Organisations**

A Research Report

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MASTER'S DEGREE IN BUSINESS LEADERSHIP,

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### CONSENT TO SUBMIT RESEARCH REPORT

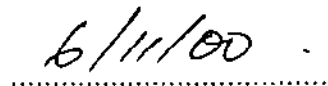
Consent is herewith given to

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## **ABSTRACT**

This research develops a framework, which can be used by organisations to ensure that the contribution of IT in these organisations can be maximised.

A literature survey, South African IT service providers, together with a single CIO case study were used as inputs. Triangulation was used as the basis to validate the study findings. Senior IT executives in top performing IT service provider organisations were interviewed by questionnaires distributed via email. The CIO was interviewed in person.

The findings indicated that there are critical success factors for ensuring effective IT contribution in an organisation. These results were used in the development of the framework.

The framework consists of components that help in achieving effective IT contribution in organisations by reducing uncertainties, and building a capable delivery engine within an IT department. The components considered in the framework include, the external environment, IT strategy, processes and capabilities and core policies and standards.

## DECLARATION

I declare that this research report is my own, unaided work. Where applicable reference to the sources used during the research are given. This research report is submitted in partial fulfilment of the requirements of the degree of Master of Business Leadership in the University of South Africa, Pretoria. It has not been submitted before for any degree or examination in any other University.



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Roberto Redaelli

30 November 2000

## DEDICATION

To my wife, Isabella.

It has been a long four years. Without your love, support and encouragement this may never have happened.

To my children, Michele and Angelica

Thanks for your time. It most probably did not make any sense to you. At last it is over, and one day you will be able to read it. For now let's just go and play.

To the rest of my family.

Thank you for your support especially during the times that you took care of Isabella and the kids.

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## GLOSSARY OF TERMS

Cost Benefit Analysis	The process of comparing the various costs associated with an investment, with the benefits and the profits which it generates. Cost benefit analysis attempts to demonstrate whether the investment will earn a sufficient return in order for the organisation to consider it to be economically viable.
Macro Model	A high level model employing general concepts, or rough drawings, or imprecise fabrications to present a conceptual picture which will conceptualise the problem or opportunity as well as provide a suggested solution.
Market Capitalisation	The market value of all fully paid and issued ordinary shares calculated in the closing price of a given day.
Meso Model	Adds some detail to a macro model, but will still be expressed primarily in generalities.
Micro Model	A detailed model which attempts to be closer to reality and thus to use more specific or life-like representation or values.
Model	A model may be described as representation of an artefact, a construction, a system, or an event or

sequence of events. The representation may be abstracted into symbols, equations and numbers; it may consist of a picture, drawing, or a fabricated likeness such as a model aeroplane, or it may be an expression of a situation or relationship in words.

**Total Cost of Ownership** Includes all the costs of ownership such as:

- Acquisition cost
- Repair costs
- Maintenance costs
- Operating costs
- Salvage/resale costs
- Disposal costs

## LIST OF ABBREVIATIONS

BV	Boundary Values
BPR	Business Process Reengineering
CAGR	Compounded Annual Growth Rate
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CIO	Chief Information Officer
CRM	Customer Relations Management
CSF	Critical Success Factors
EM	Experimental Methods
ERP	Enterprise Resource Planning
ESP	External Service Provider
IE	Information Economics
IRR	Internal Rate of Return
IS	Information System
IT	Information Technology
MOMC	Multi Objective, Multi Criteria
NPV	Net Present Value
ROA	Return on Assets
ROI	Return on Investment
ROM	Return on Management
TCO	Total Cost of Ownership

VA Value Analysis

JSE Johannesburg Stock Exchange

## CHAPTER 1

### BACKGROUND TO THE RESEARCH

#### 1.1 Introduction To The Research Problem

*'IT is becoming so powerful and transforming a medium that it will serve as the engine of innovation and the foundation of growth for enterprises world-wide. Virtually no enterprise can extend its markets, generate its products and services, communicate with suppliers and buyers, manage its investments or communicate with its customers and employees without IT. For chief executives, IT is now the global language of business, rising to the top of the priority lists, thanks to the year 2000 initiatives, coming under heavy examination. Business managers will no longer make business decisions without including elements of IT; and IS organisations will no longer make technology decisions without the explicit partnership or sponsorship of the business. Indeed, enterprises that continue to treat those issues and decisions separately - a business project vs. an IT project - are rapidly falling behind.'* Gartner (1999c).

The terms IT (Information Technology) and IS (Information System) are now defined. In the late 1980s, Duffy & Assad (1989) defined Information Technology as *'a computer and communications equipment, programmes and systems'*. They also defined information systems as *'the structured ways of processing data and providing information, which*

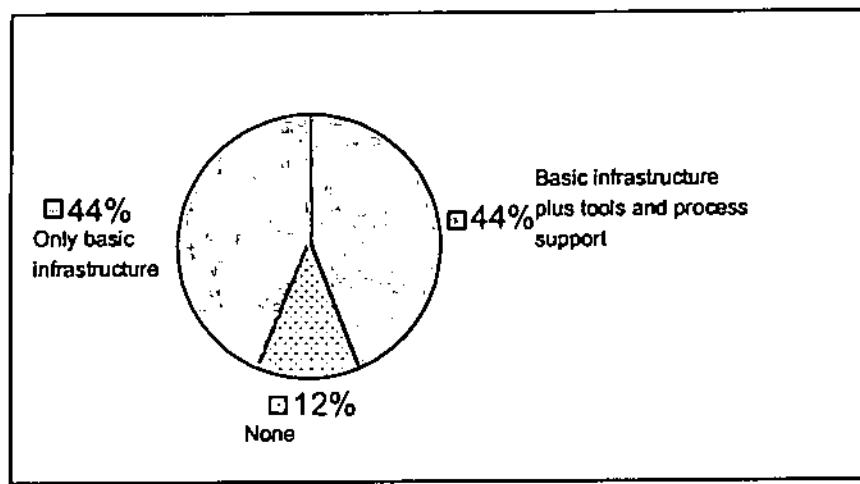
often include IT'. Cats-Baril and Thompson (1997) define Information Technology as '*Technology that has the capability to accept, store, manipulate (process) and output data.*' They define Information Systems as '*a system composed of a goal, data, information technology, people, and procedures*'. In their book on Mastering Information Management, Marchand and Davenport (2000) define IT as '*The hardware and software that is used to process information*'. In this research report the term IT is predominantly used, these references typically apply to IS as well. For those references that are particular to their respective definitions, a clear indication that the context applies to the one and not both will be given.

Leading on from the opening paragraph of this chapter it can be said that IT has and will continue to be an integral part of an organisation's ability to deliver products and or services on a global basis. But what is happening with the use of IT in organisations? If we trace back to the work of Parker and Benson (1988) in the late 1980s, we discover that they already identified the power and usefulness of IT. In their book, Information Economics, they stated that '*information technology is a fundamental force in reshaping the business world*'.

Looking at the situation today, Remenyi, Money and Sherwood-Smith (2000) state that there is considerable doubt in many circles that investment in IT has proved economically successful at all. According to Anandarajan and Wen (1999) expenditure on IT has been estimated to

be approximately 50% of certain companies' total business expenditures. They further add that most CEOs' believe that their firms are not getting the most of their IT investments.

Figure 1 contains the results of a 30 company sample by Forrester (1998c) regarding IT's contribution in organisations towards innovation.



**Figure 1 What support does IT provide to your innovation process**

Source: Forrester (1998c:4)

In an article by Tracy Mayor in CIO (2000:1), Mayor states that executives are saying *'If guys are always late and always coming back to the well for more money, what's the value of IT? What's the outcome here?'*

Leading on from this theme, Giaglis, Mylonopoulos and Doukidis (1999) list a number of causes regarding the difficulties of appraising IT investments:

- The intangible nature of the benefits.
- The benefits of IT are realised in the long run.

- Strategic and competitive advantages are inherently difficult to quantify.
- The benefits of IT are indirect and therefore indistinguishable from several confounding factors.
- The theories and techniques available are inappropriate for understanding and capturing the value of information systems.

The implementation of IT related projects, has also never been a smooth ride. A survey conducted by KPMG (Whittaker 1999) in April 1997 focussed on IT project management issues. The questionnaire was sent through to 1,450 leading public and private sector organisations in Canada. The three most common reasons identified for project failure were:

1. Poor project planning. Inadequate risk management and project planning.
2. A weak business case. System requirements must be traceable to the organisations needs.
3. Lack of top management involvement and support. Projects are doomed to failure even before they start.

Then there are the issues between the users of IT and IT personnel. In his article on building an information technology service culture Hays (1997) talks about the culture gap that exists between IT staff and the users of IT. Common complaints that are typically heard are excessive costs and insensitive response. He adds this typically lands up in a

continuing battle where IT management and staff have to prove their departments' worth. This more than often results into a downward spiral of conflict.

The role of CIO has become more and more under the spotlight. CIOs are under tremendous pressure to ensure that their own role is understood and that their departments deliver effective services - else be outsourced. The literature is full of suggestions on the role of the CIO as well as the capabilities that an Internal IT department should have. Boyle (1994) and Gibson and Miller (1995), Stephens, Mitra, Ford and Ledbetter (1995) to name but a few, describe in their respective articles the role of the CIO.

Venkatraman and Henderson (1999) argue that the inability to realise value from IT investments, is in part due to the lack of alignment between the business and IT strategy of organisations. Feurer, Chaharbaghi, Weber and Wargin (2000) and Bryan (1990) all present ideas and concepts about the alignment of business and IT strategy.

To remain competitive organisations can no longer focus upon the obvious but need to search for new opportunities. New demands will be placed on IT and they will have to supply the correct applications and services to meet this demand. This is well illustrated in Figure 2.

	Strategic		Tactical
<b>Information Systems (IS)</b> - demand	Creating a business environment in which the right IS applications can be identified to satisfy demand	<b>Applications</b>	Establishing the detail of business requirements and application needs
<b>Information technology (IT)</b> - supply	Creating the managerial and technical environment in which supply is to take place		Creating systems which satisfy the needs of an application

**Figure 2 IT/IS Management Issues**

Source: Edwards, Ward & Bytheway (1995:3)

The focus of this research report is thus to make some progress towards understanding the issues, processes and structures that need to be in place for an internal IT department to be able to deliver value to the organisation. The approach of the research was to review the available literature and identify the main factors that affect IT value realisation in some way. By then interviewing, in the form of a questionnaire, industry specialists in the delivery of IT services, we can ascertain how close or far South African organisations are in having an IT department that is visibly contributing to the organisations success.

In conclusion the management dilemma can be dramatised as follows:

**Line Managers:** *'Great conference on CRM the other day. This must be the way*

*to go. I wonder if our IT department have heard of this buzzword. .... WHAT! you are going to charge me how much to recover your expenses'.*

**Consultants:** *'Try this silver bullet - one size fits all. We can change it as we go along if necessary'*

**IT Staff:** *'No one listens to us, I've been telling the sales manager for ages that he needs an object oriented database for his customers'*

**CFO:** *'IT is just a cost, we must keep costs down. John is an excellent network guy but he does not understand business fundamentals'.*

**CEO:** *'What do I do, I am sure IT can add value and work, All Over LTD. are selling and delivering widgets all over the world. What are we doing wrong?'*

## 1.2 Importance Of The Research

*'Imagine the Internet could work intelligently for you. Imagine if all you had to do was send your research request into cybersphere and then sit back and relax while the information was gathered and compiled'. A quote taken from an article that appeared in the Financial Mail (1999a:1). The article refers to a product from Hewlett-Packard, Electronic Services Broker (ESB), that allows providers to advertise across the Internet; spontaneously discover and ally with complimentary services; and negotiate to broker, bill and manage their products. From this it is apparent that the boundaries of organisations are changing. Time and distance are no longer factors.*

In their book, Hope and Hope (1997) define the third wave economy as the information age or digital age that we are now in. This wave is dominated by service organisations. In the USA this accounts for 74% of jobs. The third wave economy is impacted on and by:

- Technology;
- Global Markets;
- Government driven changes (deregulation);
- The changing face of competition;
- The changing pattern of employment; and
- The rise of knowledge as the key economic resource.

Accepting these new realities is not easy. The third wave, with new opportunities and challenges, brings along new problems, and it seems that we haven't even sorted out the 'old ones' yet. The Internet is and promises to change how organisations do business.

*'We want to make people's life more convenient and enjoyable by combining household appliances and the resources of the Internet - A quote in Mobile Communications International (1999) by the CEO and president of Electrolux.*

The Internet market is huge. Figure 2 illustrates the spending that US companies will be spending on Internet services from 1999 to 2004.

	1999	2000	2001	2002	2003	2004	1999-2004 CAGR (%)
Consulting Services	1,266.0	2,010.2	3,024.3	4,452.1	6,211.8	7,154.8	41.4
Implementation and/or integration services	6,339.2	9,310.7	13,582.7	19,747.1	26,405.5	29,859.6	36.3
Operations Management	1,152.9	1,869.2	2,865.1	4,326.2	6,190.8	7,011.8	43.5
<b>Total</b>	<b>8,758.1</b>	<b>13,190.1</b>	<b>19,472.1</b>	<b>28,525.4</b>	<b>38,808.1</b>	<b>44,026.2</b>	<b>38.0</b>

**Table 1 US Internet Services Spending by Service Type, 1999-2004 (\$M)**

Source: International Data Corporation (IDC), South Africa, 2000.

According to US research house International Data Corp (IDC) commerce on the Web will rocket too more than 1 trillion USD by 2003.

They also state that the number of users will soar from 31 million in 1998 to more than 183 million in 2003 (Financial Mail 1999b).

In an article in the Financial Mail (1999c:1) the following statement is made *'The information age is in essence an economic and not a technical revolution. As such it affects the very environment in which business and government is conducted'*. The same article further states that *'organisations that cling to established ideas about how cost structures work or how value chains are built will dig themselves in to the wrong areas'*.

IT concerns are no longer just about cost of and time to deliver projects. According to Farbey, Land and Targett (1993) organisations IT concerns revolve around whether their IT investments are gaining short term competitive advantage, whether further investments can maintain their lead, and whether their competitors investments are putting them at a competitive disadvantage. They identify two reasons of why IT has changed:

1. A rapid increase in the capabilities of IT, such as increased power and improved linkages and connectivity, combined with substantial reductions in its cost.
2. Organisations in both public and private sectors have been subject to severe competitive pressures and turbulence in their spheres of operation. Four aspects are highlighted:

- i. Social.* Consumers heightened expectations of quality, price and environmental issues.
- ii. Political.* Collapse of the USSR, opportunities in Eastern Europe, regulatory changes.
- iii. Economics.* US trade and budget deficits, rise of Japan, implications of a united Germany.
- iv. Technological.* Rapid developments in product, process and information technology, advances in biosciences.

With the dawn of the New South Africa and the readmission into the global arena many doors have been opened with respect to trade opportunities. Competition has thus increased. If we are to play in this arena we must ensure that we harness the power of IT.

As a consequence of an African Renaissance as spoken by the President of South Africa, Mr TM Mbeki, is the need for Africa to begin to seek solutions to their own problems. This taking place while still grappling with the issues of globalisation. The social and economic issues are huge and technology, especially telecommunications can play a huge role in helping achieve these objectives. However, we first have to make sure that we can implement IT systems that are cost effective and relevant.

The business models of the past are changing. Organisations have to find new ways to compete. Just as fast as some companies are making

huge profits others are filing for bankruptcy, or shareholders demanding the heads of the executive management.

The history of IT contribution has been poor. With such a poor track record it is time to take stock of what the situation is like in South African organisations. Armed with this knowledge we then need to devise models, systems and structures, so that we can navigate the future waves with certainty and confidence in our ability to use IT to deliver value.

### **1.3 Overview Of The South African IT Industry**

The following section is a brief overview of the IT industry in South Africa from a service provider perspective.

The Financial Mail Top Companies Millennium edition (2000) identifies 26 companies in the IT sector that are listed on the Johannesburg Stock Exchange. Dimension Data heads the sector with a market capitalisation of 56 454,1 (Rm) at September 1999, a rise of 33% over the previous year. Datatec ranked second, with a market capitalisation of 13 798,2 (Rm) at March 1999, a rise of 66% over the previous year. Both Dimension Data and Datatec are global companies. Earnings from non-African operations for Dimension Data in the year to March 2000 were at 74%. Datatec in the year to March 1999 was at a staggering 90%.

Dimension Data has also been accepted into the London Stock exchange top 100.

The aim of the previous paragraph was not to show case these two companies, but rather to illustrate the success that South African IT service provider companies have achieved on an international basis. This would indicate that the technical skills of these companies are competitive on an international basis and are capable of adding value. A list of all the IT companies referenced in this article is given in Appendix E.

Duncan Todd, in the same article, states that IT has gone through the following waves:

Wave one - the focus was on improving the quality of internal business operations:

Wave two - the focus was on ERP (Enterprise Resource Planning) and supply chain efficiency.

Wave three - the focus will be externally focused. Typical areas being Customer Relations Management and e-commerce. By focusing on the customer we see a tie in with the service wave mentioned earlier (Hope and Hope, 1997)

The supply of IT services is also found in the various management consultants in South Africa. These services range from strategic planning

through to implementations. A list of most of the current Management Consultants operating in South Africa can be found in Appendix F.

#### **1.4 Research Objectives**

The objectives of this research, in light of the research problem as postulated, are to:

Proposition:

- A framework can be derived that specifically addresses the realisation of effective IT contribution in a company.

More detail on this is provided in Chapter 3.

#### **1.5 Report Structure**

The research report is divided into 8 Chapters. Chapter 1 introduces the research problem and the importance of the research in the current environment. The current South African IT service provider industry is also described. Finally the research objectives that this research report tries to address are described.

Chapter 2 discusses and summarises the available literature regarding the various facets of IT and IT value delivery. This chapter identifies the key areas that affect IT value according to the literature.

Chapter 3 presents the research objectives and the research questions stemming from the research objectives.

Chapter 4 describes the methodology followed during this research. It includes a description on the sample selection, questionnaire design and administration. The limitations of the research report are also discussed.

Chapter 5 lists the findings of the questionnaire from the various IT service providers and the CIO case study.

Chapter 6 analyses all the research findings.

Chapter 7 presents a framework towards ensuring IT contribution in organisations .

Chapter 8, the final chapter, describes the research objective achievements, future research possibilities and final remarks on the topic.

Chapter 9 is a complete list of references used by this research report.

Chapter 10 contains all the appendices referenced in this research report.

## CHAPTER 2

### LITERATURE REVIEW

#### **2.1 Introduction**

This chapter presents the findings of the literature survey. Any discussion on the contribution of IT needs to understand the definition of value and in particular IT value. The literature was scanned to determine an understanding of IT value within an organisation.

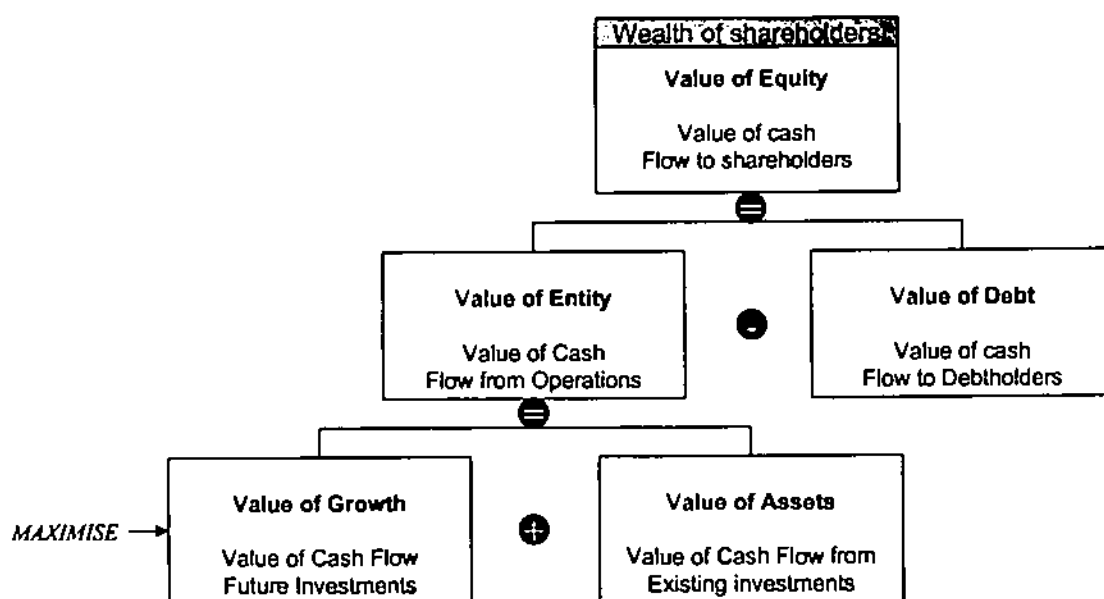
The literature survey then concentrated on identifying what the latest factors that contribute to ITs' lack of positive contribution in organisations are. Following this initial survey, a more focussed survey was performed on understanding these issues in greater detail.

#### **2.2 Understanding IT Business Value**

*'It is argued that a weakness in much of the current research is the fact that the definition of value is usually unclear, frequently inadequate, often partisan and sometimes completely absent from the discussion. Until there is a better understanding in the IT community of what value is and how managers attempt to optimise it, current IT evaluation methods for complex decision making purposes will often be neither credible or effective' (Remenyi, Money and Sherwood Smith, 2000:288).*

*'Context and perception play an important role in determining value. Two organisations generating identical benefits may well have different views of the values of their systems (Remenyi, Money and Sherwood-Smith 2000:58-59).*

In his book on the Valuation of Information Technology, Gardner (2000) focuses on value from a shareholders perspective. He defines the responsibility of management to generate sustainable high returns for their shareholders. He states that the maximisation of shareholder wealth consists of the maximising of the value of cash flows generated by operations. The operations referring to IT systems. A method for analysing investments is discussed in the book and is covered later in this report. For now we will concentrate only on the definition of value. Figure 3 highlights this strategic concept.



**Figure 3 Strategic Objective: Maximise Value of Growth**

Source: Gardner (2000:4).

Gardner (2000) further defines a framework for analysing the economics of IT systems. This framework can be divided into three steps:

**Step 1:** Identifying the target customer opportunity.

**Step 2:** Aligning the IT system to cost effectively provide the features that the customer wants.

**Step 3:** The value obtained is then the difference between the cost and the revenue discounted over time.

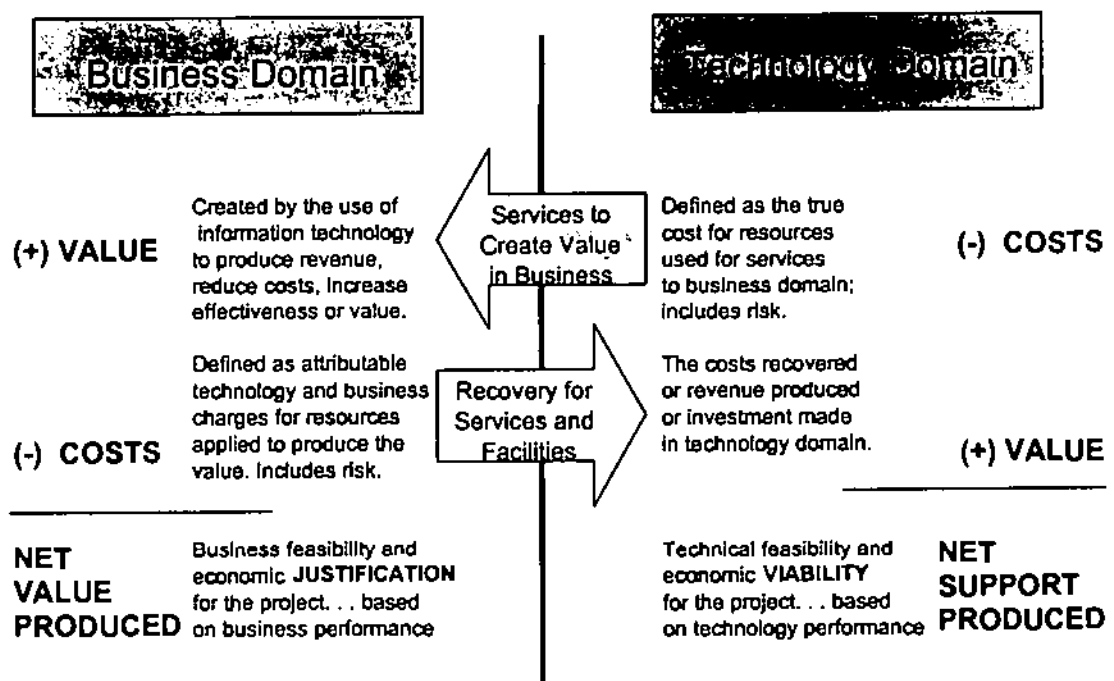
The above discussion starts to enter the realm of evaluation, this is discussed later. The role of understanding the customer is emphasised.

Gardner (2000) points out the following regarding customers:

- Understanding the customer opportunity and assessing the demand for the services that it will create.
- Understanding the features that they will value most and the amount that they are willing to pay for.
- Identify where the value can be added by clearly understanding the information requirements of the activities performed.
- Understanding the fact that some customers may not recognise the need for the system immediately.

A component of value, from this discussion, is that the customer has to be satisfied, and the price being paid is commensurate with its value.

Parker and Benson (1988) defined value based on the improved business performance, and cost based on total organisational cost, which taken together define the true economic impact of information technology. They then identify two concepts, the justification of IT and the viability of IT. The justification for information technology is the balance of value and cost assigned to the business. Viability is based on the value of the IT to the IT department compared to the cost of using the technology for the service organisation. This is depicted in Figure 4.



**Figure 4 Information Economics**

Source: Parker and Benson (1988:76)

They add that value is 'based on advantage achieved over the competition, reflected in current and future business performance. That

*which will add to the advantage over the competitors of a firm is the value in which management should be willing to invest'* (Parker and Benson 1988:64). They then categorised value into the following categories:

- Return on Investment
- Strategic Match
- Competitive Advantage
- Management Information Support
- Competitive Response
- Strategic IS Architecture

In the book *Mastering Information Value* the editors Marchand, Davenport and Dickson (2000:152-159) identify five principles for effectively capitalising on the value of IT.

1. *Business Impact*: Value realisation by creation of new business models using products and processes.
2. *Communities of practice*: Value realisation by having an organisational structure that can handle professionals with complementary expertise and co-ordinate them to work hand in hand across traditional boundaries.
3. *Selective Sourcing*: Value realisation by developing relationships with various suppliers with differing and required capabilities.
4. *Knowledge infrastructure*: Value realisation achieved by designing organisational systems and structures that support learning.

5. *Strategic alignment*: Value realisation by the alignment of the previous four principles.

According to Marchand, Davenport and Dickson (2000:296-297) there are four fundamental ways of using information to create business value.

1. Manage risk.
2. Reduce costs.
3. Know your customer and share this knowledge with partners and suppliers.
4. Mobilising people and collaborative work processes to share information and promote discovery (create new products or services using new technology) throughout the company.

According to research performed on 20 IT departments of Fortune 500 companies by Omega Point Consulting and Icx (Bicknell, 1997), three levels of moving towards successful IT value contribution are identified.

1. Need a flexible and reliable architecture.
2. IT department must be able to manage both operations and customer support effectively.
3. IT department to participate in all business re-engineering projects.

Cronk and Fitzgerald (1999) propose that: *'IS Business Value is the sustainable value added to the business by IS, either collectively or by*

*individual systems, considered from an organisational perspective, relative to the resource expenditure required'.*

They further propose three dimensions of IS business value:

1. System Dependent Dimension. Value that is added to the organisation as a result of the system characteristics. Examples of this include accuracy, response time, down time, timeliness, semantic quality.
2. User Dependent Dimension. Value that is added to the organisation as a result of user characteristics. Examples of this include skill level and attitude.
3. Business Dependent Dimension. Value is indicated by the alignment between systems and business goals. The value is reflected in the realisation of the business goals.

Cronk and Fitzgerald (1999) conclude that to understand all the aspects of value contribution; measures for each of these dimensions have to be part of an evaluation methodology.

In a research note by Gartner (1998a) they comment that client's repeatedly raise the same question: What are the simple methods of quantifying and demonstrating business value? Three answers are then provided in the article.

1. IT enabled Sales and Revenue.

2. IT Reduced Cost of Sales and Support.
3. IT Reduced Cost of Purchasing and Procurement.

To conclude the discussion on understanding IT value a generic look at Value is done that embraces the various topics discussed in this section. In their book Operations Management: A Value driven approach, Melnyk and Denzler (1996:974) define value generically as, *'the customers subjective evaluation, adjusted for cost, of how well a good or service meets or exceeds expectations'*. They further identify the elements of value and define the value equation (See Figure 5).

$$\text{Value} = \frac{\text{Performance}}{\text{Cost}}$$

$$\text{Performance} = \beta_1 \times \text{Quality} + \beta_2 \times \text{Speed} + \beta_3 \times \text{Flexibility}$$

The weighting,  $\beta$ , can be, many factors.  
 Could be affected by market conditions, culture, nationalities, class of technology etc

- Performance** : describes what the good or service does for the customer.
- Quality** : represents how well the good or service meets or exceeds the expectations of the customer at the time of purchase.
- Speed** : describes the time needed to deliver the good or service to the customer or the time that the firm needs to design and produce the good or service.
- Flexibility** : reflects how easily the firm can change the product to more closely match the needs of the customer.
- Cost** : represents all costs that the customer incurs to acquire, use, and dispose of the good or service

**Figure 5 Value Equation and Value Elements**

Source: Melnyk and Denzler (1996:47-48)

The above can easily be used to reflect IT value. **Quality** could address the customer requirements, standards, and architecture. **Speed** could represent speed of service delivery (responsiveness of IT department) or time to market for a new product or service. **Flexibility** could represent the ability for the product or solution to embrace new technologies or techniques. Architecture would also fall in here. **Cost** is as per the description in Figure 5.

### **2.3 Factors Affecting Effective IT Value contribution**

In approaching this part of the literature survey, surveys, articles and books were scanned to determine what the main factors were that impeded effective IT value contribution.

As an introduction two top technology issues lists are presented in Figure 6. The one list is the result of a survey performed in 1995 and the other performed in 1999. The 1995 list is from a book by Kit Gründley (1995). 5000 IT executives, who are members of the Price Waterhouse international computer opinion panel, and a further research programme conducted in 102 major corporations through out the world, took part in this survey. The second list is from Raphaelian (Gartner, 1999) and is based on findings in the USA and Canada.

<u>Rank</u>	<u>List One 1995</u>	<u>List Two 1999</u>
1.	Culture gap between IT and business professionals	IT and Business Strategic Alignment
2.	Imprecise corporate objectives for IT	Aligning IT and Business Goals
3.	Time taken to develop IT systems	Solving Year 2000 problems
4.	User knowledge gaps on IT	Recruiting and Retaining IT Staff
5.	Intangible nature of IT benefits	Measuring IT and IS Organisation Efficiency
6.	IT professional knowledge of gaps in business	Using IT for Competitive Breakthroughs
7.		Reducing IT Costs
8.		Demonstrating Business Value of IT
9.		Developing an IT Architecture
10.		Improving Project Delivery

**Figure 6 Top CIO Issues**

### 2.3.1 IT Departments

Remenyi (1999:18) references a study by Lacity and Hirschheim where they point out that *'only two of the thirteen companies that participated in the study agree that there IS departments are critical to corporate*

*success. The remaining eleven companies all see their IS departments as necessary, but burdensome, cost pits'.*

In their article on Outsourcing, Pinnington and Woolcock (1995) identify the following drivers for outsourcing.

- Cost control and reduction
- Focussing on core competencies
- Access to new expertise and technologies
- Improved flexibility
- The custom in a particular industry

Ignoring the second driver, as it may be out of the control of the IT department, the remaining drivers such as cost control and reduction, improved flexibility and access to new expertise and technology need to be addressed by the IT department. Else they may face the risk of being completely outsourced.

The following table (Figure 7) summarises the core capabilities that were found extensively in the literature that are required by IT personnel (Definitions of the capabilities can be found in Appendix G).

<u>No.</u>	<u>Capability</u>	<u>Reference</u>
1.	Leadership (CIO role)	Marchand, Davenport & Dickson (2000) Feeny & Willcocks (1998) Schlier & McNee (1998) Stephens, Mitra, Ford and Ledbetter (1995) Miller and Gibson (1995), Boyle (1994)
2.	Business Systems Thinking	Marchand, Davenport & Dickson (2000) Blodgett (1999) Gartner (1999b) Hilderbrand (1998) Feeny & Willcocks (1998)
3.	Relationship building (with users) based on service	Marchand, Davenport & Dickson (2000) Gartner (1999b) Feeny & Willcocks (1998) Forrester (1998a) Deutsch et.al. (1998) Hilderbrand (1998) Wilson (1998) Schlier & McNee (1998) Hays (1997)
4.	Architecture planning	Marchand, Davenport & Dickson (2000) Feeny & Willcocks (1998)

<u>No.</u>	<u>Capability</u>	<u>Reference</u>
5.	Technical skills	Marchand, Davenport & Dickson (2000) Feeny & Willcocks (1998)
6.	Procurement skills	Marchand, Davenport & Dickson (2000) Gartner (1999b) Feeny & Willcocks (1998) Hilderbrand (1998)
7.	Contract Facilitation	Marchand, Davenport & Dickson (2000) Feeny & Willcocks (1998) Hilderbrand (1998)
8.	Contract monitoring	Marchand, Davenport & Dickson (2000) Feeny & Willcocks (1998) Hilderbrand (1998)
9.	Vendor Development	Marchand, Davenport & Dickson (2000) Gartner (1999b) Feeny & Willcocks (1998) Schlier & McNee (1998) Hilderbrand (1998)

**Figure 7 IT Department Capabilities**

By having the right processes IT departments can get control of their key activities. The following processes, Figure 8, were identified as being important, definitions of these processes can also be found in

Appendix G. (Note: strategy alignment is omitted and discussed separately due to its overwhelming importance):

<u>No.</u>	<u>Process</u>	<u>Reference</u>
1.	Project Management	Purvis, Gordon & McCray (1999) Deutsch et.al. (1998) Linder, et. al. (1998) Forrester (1998a) Axson (1996) Edwards, Ward & Bytheway (1995)
2.	Change Management	Purvis, Gordon & McCray (1999) Gartner (1999b) Gartner (1997) Edwards, Ward & Bytheway (1995) Spewak (1993)
3.	Problem Management	Purvis, Gordon & McCray (1999) Gartner (1997) Edwards, Ward & Bytheway (1995)
4.	Capacity Management	Purvis, Gordon & McCray (1999) Deutsch et.al. (1998) Gartner (1997) Edwards, Ward & Bytheway (1995)

<u>No.</u>	<u>Process</u>	<u>Reference</u>
5.	Disaster Recovery Procedures	Purvis, Gordon & McCray (1999) Gartner (1997) Edwards, Ward & Bytheway (1995)
6.	Service Level Management	Purvis, Gordon & McCray (1999) Deutsch et.al. (1998) Forrester (1998a) Gartner (1997) Edwards, Ward & Bytheway (1995)
7.	Technology Management	Cameron (2000) Purvis, Gordon & McCray (1999) Linder, et. al. (1998) Gartner (1997) Gründley (1995) Edwards, Ward & Bytheway (1995) Spewak (1993)
8.	Application Management	Purvis, Gordon & McCray (1999) Deutsch et.al. (1998) Gründley (1995) Edwards, Ward & Bytheway (1995) Spewak (1993)

<u>No.</u>	<u>Process</u>	<u>Reference</u>
9.	Standardisation	Marchand, Davenport & Dickson (2000) Linder, <i>et. al.</i> (1998) Forrester (1998a) Deutsch <i>et.al.</i> (1998)

**Figure 8 IT Department Processes**

A Gartner survey (1999) revealed that IT is important to the business strategy and success, however only about half of the firms elevated CIOs and IT directors to the board of directors.

According to Edwards, Ward & Bytheway (1995). IT personnel are very mobile. The demand on their skills is high. This has resulted in a major culture gap between the values of the business manager and the personal ambitions of and values of the IT specialist in the organisation. Meeting business needs is less important to the IT specialist than developing marketable skills.

IT departments need to change. Forrester (1998b) define the term Catalytic IT as an IT organisation that produces fundamental, positive changes within its company - changes that catapult the company forwards in its markets.

### 2.3.2 An Architectural Viewpoint

Szyperski (1998:366) gives a comprehensive definition on architecture. This definition is taken from his book on Object Oriented programming and can be applied to IT and IS:- *'Overall design of a system. An architecture integrates separate but interfering issues of a system, such as provisions for independent evolution and openness combined with overall reliability and performance requirements. An architecture defines guidelines that together help achieve the overall targets without having to invent ad hoc compromises during system composition. An architecture must be carefully evolved to avoid deterioration as the system itself evolves and the requirements change'*.

Gartner (1995:4) provide a simpler definition of an IT Architecture: *'an IT Architecture is a formal specification of how a computer solution will be organised'*. They further identify the characteristics of a good architecture as:

- Delimitation of the problem to be addressed.
- Decomposition of the problem into components with clearly assigned responsibilities.
- Definition of all interfaces.
- Adequate documentation.
- An auditing mechanism.
- Be able to respond to changing requirements and technologies.

- Policies, practices and organisational structures that facilitate adoption of the architecture.

Gardner (2000:81) also provides a simpler definition. *'Aligning an information technology system with a customer opportunity is accomplished by constructing an information technology system architecture. The term information technology system is defined as the organisation of information technology resources to accomplish a business purpose'*.

A final definition on Architecture and the advantages and disadvantages (see Figure 9) given next is taken from Hogbin and Thomas (1994:95). *'An architecture describes the whole in terms of the sum of its parts; it promotes consistency and gives a basis for change by providing flexibility. An architecture is a structure; it is the result of a process of analysis and design which describes the boundaries of the component parts and their interfaces. It provides the basis for more detailed design. Architecture is important to the application of IT as it affects the level, timing and life of investment'*.

Advantages	Disadvantages
Enables data and systems functions to be more easily shared across users.	Requires a broader consideration of primary and secondary user requirements.
Reduces the cost and time-scale of extensions to systems.	Requires longer planning horizons.
Provides for future flexibility and growth in systems function.	Takes time to produce the architecture and to build the infrastructure.
Reduces duplication of data and function within different systems.	Adds to the cost of architecting, which has to be recovered from future systems.
Helps to eliminate errors at the design stage, where cost of correction is minimal.	Requires a more visionary and longer-term approach, particularly in terms of user executive support.
Reduces the level of costly systems maintenance activities.	Specialist skills are needed within the IT department.
Facilitates management direction and control of IT.	Requires higher management skills for implementation.

**Figure 9 The advantages and disadvantages of the architected approach**

Source Hogbin and Thomas (1994:95)

Gardner (2000) identifies the following two components of an IT architecture;

1. *Information Architecture*: the logical organisation of information flows
2. *Technology Architecture*: describes what equipment and staff goes where and how much is needed.

Spewak (1993) identifies 4 components of an IT architecture:

1. *Systems and Technology Architecture*: describes the systems and technology platforms in use within the enterprise.
2. *Data Architecture*: Identifies and defines the major kinds of data that support the business functions defined in the business model.
3. *Applications Architecture*: Defines the major kinds of applications needed to manage the data and support the business functions of the enterprise. It is a definition of what the applications will do to manage data, and provides information to people performing business functions.
4. *Technology Architecture*: Defines the major kinds of technology needed to provide an environment for the applications that are managing the data.

The most comprehensive and all encompassing architectural framework belongs to John Zachman (Evernden, 1996). First published in the IBM Systems Journal in 1987 it has been widely referenced and

discussed. It is not the aim here to go into the details of the framework, but merely to point out some of the views of his framework, as this describes the context that IT architectures need to consider.

1. *The Organisation View*: Represents information elements that will differentiate one organisation from another. Key components of this view include:
  - Strategy
  - Structure (organisational)
  - Skills
2. *The Business View*: Represents the traditional view of data and process. Its key components include:
  - Data
  - Function
  - Workflow
  - Solutions (combines parts of data, function and workflow used to create business solutions)
3. *Technical View*: Represents the technical structures that support the business. Its key components include:
  - Interfaces
  - Network
  - System platforms

### 2.3.3 IT And Business Alignment

The importance of aligning IT and business strategy for effective IT contribution is identified in numerous articles; Bryan (1990), Edwards, Ward & Bytheway (1995), Gartner (1998b), Henderson and Venkatraman (1999), Feurer Chaharbaghi et al (2000), Remenyi, Money & Sherwood-Smith (2000) and Marchand, Davenport & Dickson (2000) to list but a few.

Forrester (1998b) states that effective IT strategy planning results in:

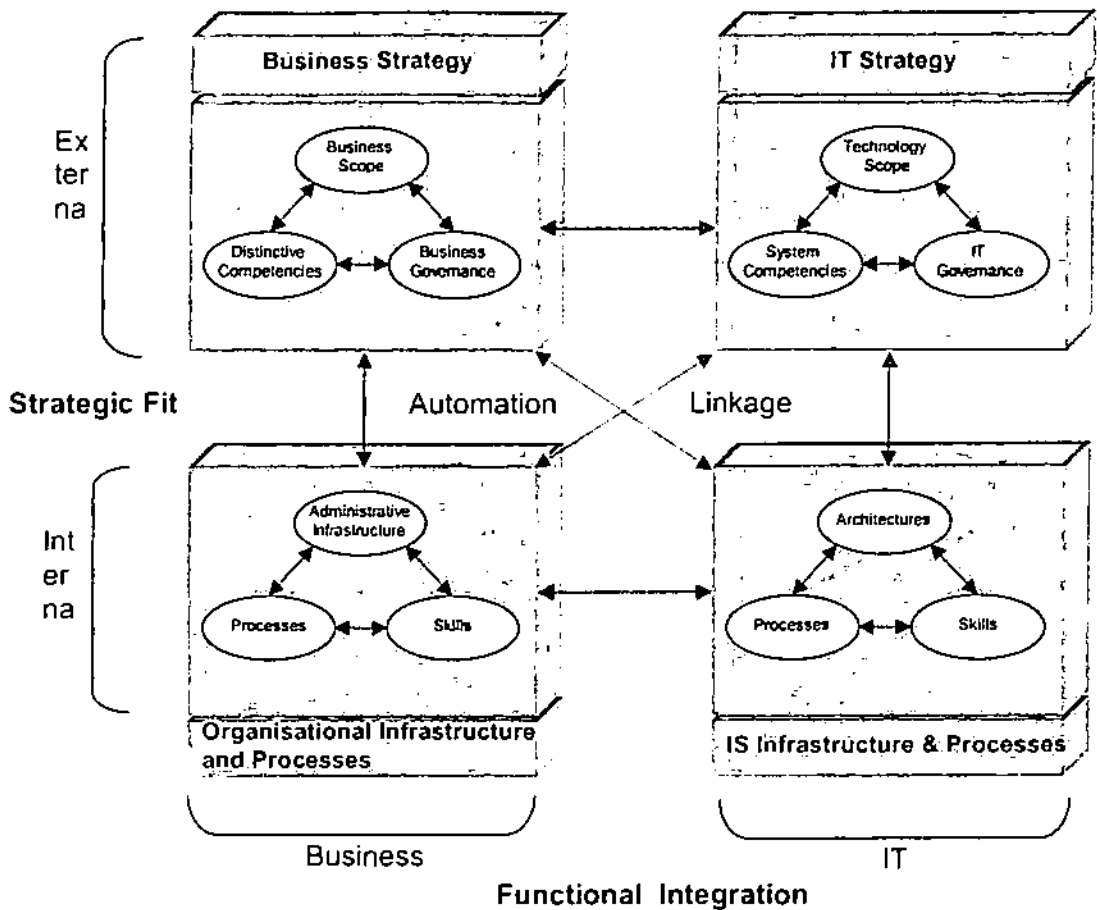
- Clarity about the organisations strategic direction, and
- An understanding of the difficult tradeoffs managers must make to achieve critical objectives and goals.

In their article Feurer, Chaharbaghi et al (2000) state that processes and IT need to be carefully aligned with the overall organisations objectives and interfunctional teamwork. They further add that strategies determine the critical success factors that in turn define the necessary business processes and information needs. Business processes are translated into feasible application models while information requirements are translated into workable data models. This then facilitates the understanding of gaps, and the differences between ideal and workable solutions can be minimised.

Henderson and Venkatraman (1999:472) identify two fundamental assumptions that their concept of strategic alignment is based on:

- *'Economic performance is directly related to the ability of management to create a strategic fit between the position of an organisation in the competitive product-market arena and the design of an appropriate administrative structure to support its execution'.*
- *'The strategic fit is inherently dynamic'.*

Their strategic alignment is defined as being based on two building blocks: strategic fit and functional fit. The strategic fit looks at the external and internal business domains. In their Strategic alignment model (Figure 10), they specify two types of integration between business and IT domains. The first is strategic integration. This is the link between business and IT strategy. The second, operational integration, links organisational infrastructure and processes with IS infrastructure and processes. This highlights the fact that an organisation requires coherence between organisational requirements and delivery capability within the IT department. The final point about the model is that it requires a balancing of all four domains.



**Figure 10 Strategic Alignment Model**

Source: Henderson and Venkatraman (1999:476)

An important point by Gartner (1998b) is that the focus should not be on alignment but on integration. Business management should be educated that ultimate responsibility rests with business management and not IT management.

### 2.3.4 IT Evaluation Tools And Techniques

*'Value, and especially IT value is indeed a difficult question'*

*'Many a scholar, consultant and practitioner has tried to devise a reliable approach to measuring the business value of IT at the level of the firm, none has succeeded'.*

The above quotes were both taken from the book by Remenyi (1999:19) on IT investment. The first, a quote by the author himself, Dan Remenyi, and the second a reference to an article written by Keen.

A Gartner Research Note (1998a) states that the view of many executives in Fortune 1000 companies, as, *'this technology can be reduce support costs by \$x per year, are necessary but insufficient to justify IT investments'*.

According to Ford (1994) managers do not know how to evaluate the effects of IT investments on organisational performance. Managers are demanding to know the bottom line impact of their IT investments. He further comments that traditional methods are inappropriate, such as ROI, Payback period, NPV and IRR (defined in Figure 11) as IT is subject to continuous change, has a wide range of benefits and its strategic nature. He states that evaluation must be done in a context and for a purpose. All stakeholders should be brought together to discuss the business and how the system will fit in it.

The following table (Figure 11) lists the main methods plus their definitions. The table contains the most prominent methods found in the literature.

<b><u>Methods</u></b>	<b><u>Definition</u></b>
Business Case	<i>'A justification for pursuing a course of action in an organisational context to meet stated organisational objectives or goals. A business case frequently involves assessing the value of an investment in terms of its potential benefits and the resources required to set it up and to sustain it, i.e. Its ongoing costs'. Remenyi (1999:187).</i>
Critical Success Factors	<i>'The exploration with executives of the factors that are critical to the success of the business, in particular those that are important for the functions or activities for which the executives are responsible'. Farbey, Land and Targett (1993:112). Evaluation is thus based on these critical success factors.</i>
Game-Playing and role playing	<i>'Rather than go to the expense of building a prototype, people to role play each others jobs, first with existing systems then with the new systems'. Ford (1994:27).</i>
Information Economics	<i>'This method is a variant of cost-benefit analysis, tailored to cope with particular intangibles and uncertainties found in information systems projects. It retains ROI calculations for those benefits and costs which can be directly ascertained through conventional</i>

<u>Methods</u>	<u>Definition</u>
	<i>cost-benefit processes, but puts forward for the decision process a more complex report based on a ranking and scoring technique of intangibles and risks'. Farbey, Land and Targett (1993:104)</i>
Internal rate of return	<i>'The internal rate of return is the rate of interest which will cause the NPV to be zero. It is the internally generated return, which the investment will earn through its life. It is also frequently referred to as the yield of the investment'. Remenyi (1999:189).</i>
Multi-Objective, Multi-Criteria (MOMC) Method	<i>'This method requires measures of worth other than monetary values. It attempts to develop a general measure of utility where utility is defined as the satisfaction of an individual's preference. Utility is a measure of satisfaction. The decision to invest is made by choosing the highest satisfaction in terms of weighted preferences. This method is probably best applied to projects which attempt to meet the needs of many different users and where the benefits are intangible.'</i> Ford (1994:25)
Net Present value (NPV)	<i>'The difference between the sum of the values of the cash inflows, discounted at an appropriate cost of capital, and the present value of the original investment. Provided the NPV is greater than or equal to zero, the investment will earn the firm's required rate of return'.</i>

<u>Methods</u>	<u>Definition</u>
	Remenyi (1999:197).
Payback	<i>'The amount of time, usually expressed in years and months, required for the original investment amount to be repaid in cash flows. This measure is sometimes used with nominal cash-in flows and sometimes used with discounted cash-in flows'. Remenyi (1999:187).</i>
Profitability Index	<i>'The profitability index is defined as the sum of the present values of the cash-in flows divided by the present value of the investment. This shows a rate of return expressed as the number of discounted pound and pence which the investment will earn for every pound originally invested'. Remenyi (1999:189).</i>
Prototyping	<i>'This involves the rapid development of a prototype form of the system, typically using a fourth generation language for development. The prototype can be used to find out how users modify their behaviour when, for example they are provided with a decision support system'. Ford (1994:27).</i>
Return on Investment	<i>'Accounting or financial management term to describe how well the firm has used its resources. It is usually calculated by dividing net profit after tax by total net assets'. Remenyi (1999:198).</i>
Some form of Customer/User	<i>'Involving primary or core stakeholders i.e. the users, top management and the technical specialists involved in</i>

<u>Methods</u>	<u>Definition</u>
Involvement	<i>the task of delivering information systems benefits, participate in the evaluation and the subsequent decision making associated with the project. These stakeholders are consequently involved in moulding and realising an information system which is targeted to meet real business benefits with which the user community can identify are implemented'. Remenyi Sherwood-Smith (1999:14).</i>
Value Analysis	<i>'This method emphasises benefits rather than costs and its is used primarily for evaluating concepts such as 'better information'. It begins with the observation that most successful innovations are based on adding value rather than on reducing costs. The method uses a variety of techniques to establish the values of the outputs, these techniques are iterative and exploratory e.g. Delphi approach (i.e. 'ask the oracle')'. Ford (1994:26).</i>
Balanced Scorecard	<i>'A tool for communicating corporate goals to the frontline workers who are responsible for reaching them. It balances traditional financial measures, such as net income and ROI, with operational measures - customer satisfaction, internal, business, processes and an organisation's ability to innovate and learn. The scorecard lists goals and then measures and records</i>

<u>Methods</u>	<u>Definition</u>
	<i>whether the business is reaching them. The goals are broken down into measurable metrics built from data collected throughout the business'. Young (1998).</i>

**Figure 11 IT Investment Methods and Definitions**

In an article by Remenyi, White and Sherwood-Smith (1999) on using a post-modern management approach to information systems, they state that it is essential to examine the role that language plays in the management of ensuring suitable returns from the funds invested in IT. They add that the language of computing and information systems has been a major barrier for many years and has been discussed as early as 1980. They add that a crucial point to the management of IT and IS goal posts is the involvement of stakeholders throughout projects. They refer to an article by Farbey (Remenyi, White and Sherwood-Smith 1999:25 ) in which he states that *'the process of appraising new investment is always a political process in so far as it touches on the diverse interest of many people and groups'*.

They state that *'language defines reality, and provides strong evidence of the underlying assumptions held by stakeholders'* (Remenyi, White and Sherwood-Smith 1999:27). Our language needs to change and move with the current times so as to help us manage IT under the circumstances of moving goal posts. Table 2 gives examples of the various meanings of certain words in managing IT.

<b>Old Speak</b>	<b>Assumptions</b>	<b>New Speak</b>	<b>Assumption</b>
Benefits	Mostly financial with some (a few) intangibles	Outcomes	Business performance improvements
Specification	Problem fully understood, the situation is unique and true	Co-evolution of requirements	Situation is contextual, recognise perspective differences, understanding develops over time
Deliverables	Bounded event, not unusually associated with a metric	Specific goals	Contextual, short term metrics required
Users	Distant, us and them someone else's problem	Stakeholders	A group of different interested parties
Cost benefit analysis	Financial analysis, deterministic	Benefit modelling	Comprehensive analysis. Macro, meso and micro, stochastic
Summative	Periodic	Formative	Continuous
Manage the outputs	Physical system realities	Manage the outcomes	Business performance improvements
Manage the Tools	Silver bullet	Manage relationships	People co-evolve outcomes
Define the Problem	Single point solution, set at one time, and tracked against the original definition	Manage the language	Understanding improves over time. Language defies reality. Things change.

**Table 2 Comparison of old ideas and new ideas**  
Source: Remenyi, White and Sherwood-Smith (1999:28)

## 2.4 Evaluation Frameworks

The following section describes the various frameworks that can be used in the evaluation of IT investments. Some of the previous methods may form part of these frameworks.

Farbey, Land & Targett (1993) describe a process for matching an IT investment with an appropriate evaluation method. A three phased approach is used. Phase 1 represents the project, phase 2 locates the various evaluation methods and the final phase performs the matching.

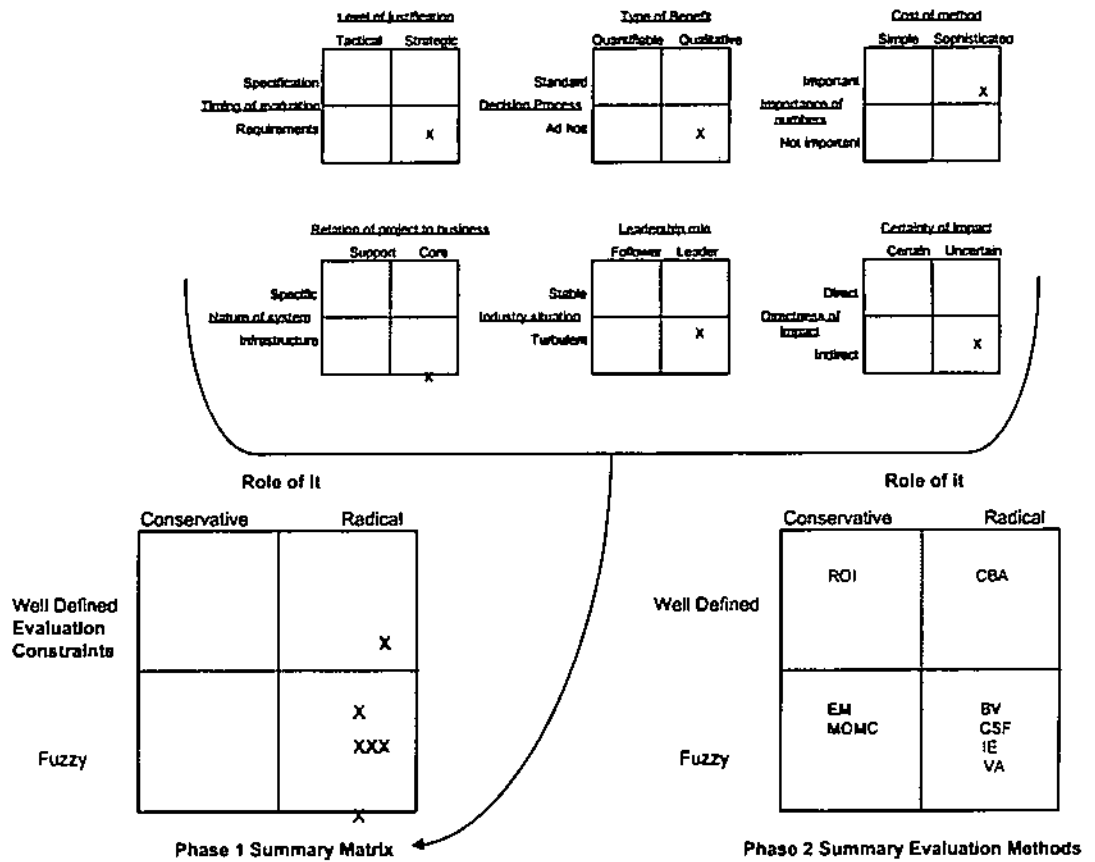
During Phase 1 six dimensions are considered and the project is evaluated against these dimensions. Questions regarding these dimensions are asked and the appropriate quadrant is selected (see Figure 12). The following briefly discusses this concept:

- Timing and level
  - Level of evaluation (is it tactical or strategic?)
  - Timing of evaluation (is the project in the requirements or specification phase?)
- Benefits and decision process
  - Type of benefits (are the benefit quantifiable or qualitative?)
  - Nature of the decision process (is the decision process standard or ad-hoc?)
- Cost of method and importance of numbers

- Sophistication of evaluation methods used (are the evaluations methods used simple or sophisticated?)
- Importance of the numbers (are numbers important or not important?)
- The system
  - Relationship of project to business (is the project a support or core system?)
  - Nature of system (is the system specific or infrastructural?)
- Organisation characteristics
  - Leadership role of organisation (is the organisation a follower or leader?)
  - Industry situation (is the industry stable or turbulent?)
- Cause and effect relationship
  - Certainty of impact (will the impact be certain or uncertain?)
  - Directness of impact (is it direct or indirect?)

Phase 2 contains the various evaluation methods based on the following dimensions, Conservative or Radical (x axis) and Well defined or Fuzzy (y axis), see Figure 12.

The figure illustrates the first two phases. The third phase is simply done by superimposing the matrixes of the previous phases and examining the density of clusters in which segment they fall into. The appropriate method can then be selected.

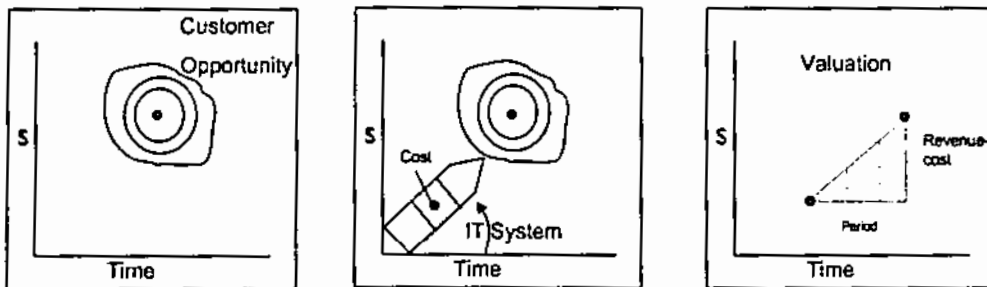


**Figure 12 Matching Evaluation Methods**  
Source: Farbey Land & Targett (1993:142-153)

A more recent framework can be found in the work by Gardner (2000), a partner at Price Waterhouse Coopers. Figure 13 displays the high level three-step process used by Gardner.

- **Step one:** the identification of the customer opportunity. During the first step the value added, market demand estimates, product requirements and understanding of the customer requirements is performed.

- Step two: the system design and architecture is done and costing of the system is performed. All capacities are calculated to ensure proper costing. The costing of the system looks at:
  - Investment Costs (capital expenditure, capitalised intangibles i.e. R&D, patents etc. and working capital to fund operations)
  - Operating Costs (labour, material, service and occupancy charges)
  - Allocated costs (costs that have to be shared)
  - Cost Variations (inflation, technology progress etc)
  - Cost Equivalency (calculate present value of costs)
- Step 3: the valuation is performed. Cash flows of the new system are identified, calculated and adjusted for risk. Typical NPV calculations are thus performed.



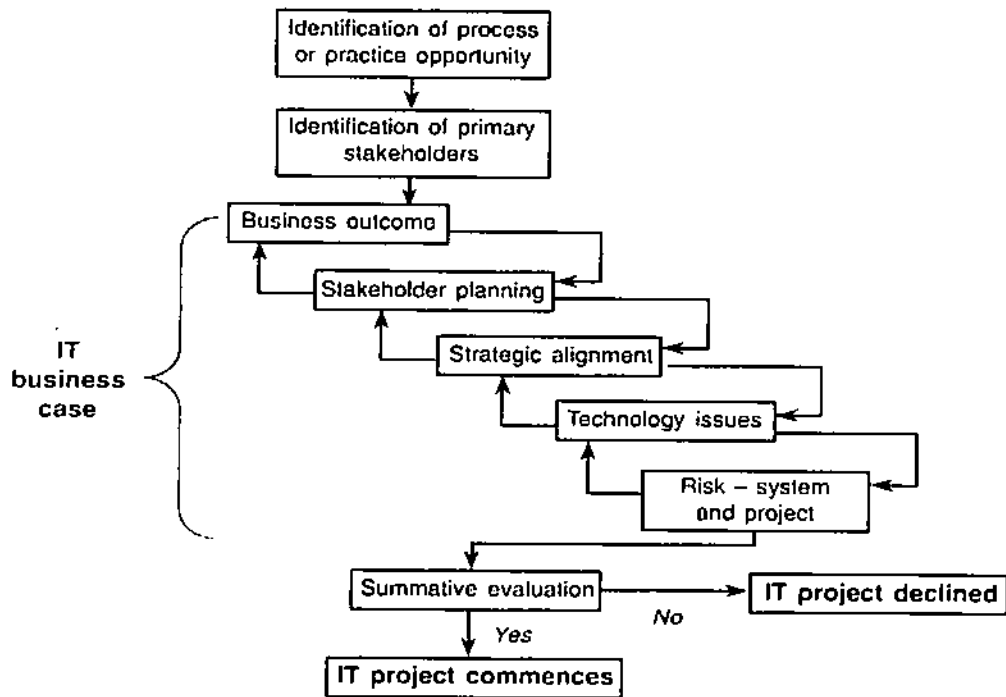
1. Identify the customer opportunity    2. Align the IT system    3. Measure economic value added

**Figure 13 Analytical Framework**

Source: Gardner (2000:5)

A business case model is defined by Remenyi (1999:25) as 'an IT business case is a model of what the organisation expects to be able to achieve when it uses IT to support improvements in its process and practices. It is a sophisticated model which is produced to facilitate the

*decision making in the IT management process and to help in this respect with what-if questions'. Figure 14 displays the IT business case process.*



**Figure 14 IT Business Case Process**

Source: Remenyi (1999:25)

An IT investment framework by Gartner (1999a) attempts to define a framework that can be used jointly by senior IT and business management to develop and balance IT investment strategies (see Figure 15). The IT component of an organisation is viewed as containing four classes of investment. The four investment portfolios are:

- *Infrastructure*: Facilities and services supporting the execution of business and IT departmental processes such as distributed systems, data center operations, network operations and help desk services.
- *Utility Applications*: Applications such as payroll or general ledger that are necessary to the operation of the business but make little or no competitive or financial operating contribution.
- *Enhancement Applications*: Contributions to productivity, customer satisfaction, production and service access. Usually provide transactional and data support to operations or assist in operational decision making.
- *Frontier Applications*: IT investments that are anticipated to enable significant change in the business model from new markets, products and services, production capabilities and delivery channels, or by providing a sustainable competitive advantage.

Each of these classes then has there own valuation criteria and investment strategy.

<b>Portfolio</b>	<b>Value (influence on the business)</b>	<b>Metrics/ Evaluation Methods (Techniques to produce metrics and valuations)</b>	<b>Risk Profile (level of risk )</b>	<b>Business Input (information source)</b>	<b>Sourcing Strategy (acquisition criteria)</b>	<b>IT Core Competency (skills required)</b>
<b>Infrastructure</b>	Business Process Efficiency	ROA, Unit Costs, Service Levels, TCO, Peer Benchmarks	Medium	Business Planning	Lowest TCO/ High Reliability	Process and ESP Management
<b>Utility Applications</b>	Lower Cost	ROI, Unit Costs, TCO, Peer Benchmarks	Low	Business Planning	Lowest TCO/ High Reliability	Maximising Scale Economies, ESP Management
<b>Enhancement Applications</b>	Lower Direct Costs, Productivity, Competitive Advantage	ROI, ROA, Peer Benchmarks, Financial Analysis, # Implemented Changes	Medium	Business Planning	Commodity purchase, Knowledge in house	Business and IT Knowledge
<b>Frontier Applications</b>	New Revenue, Cost Structure, Sustainable Competitive Advantage	ROI, Responsiveness, Financial Review	High	Business Strategy	ESP and In House Advanced Development	ESP and Integration Management

Figure 15 IT Investment Framework

Source: Gartner (1999a)

## CHAPTER 3

### RESEARCH OBJECTIVES

#### 3.1 *Introduction*

This Chapter describes the objectives of the research and the various research questions that were posed to achieve these objectives.

#### 3.2 *Objectives and Research Questions*

The objectives of this research are to:

- Derive a framework that can be used by South African organisations to ensure IT Business Value delivery.
- Understand the factors that need to be considered for ensuring IT Business Value in South African Organisations.
- Determine the current focus of which technologies are being implemented in South African organisations.
- Understand the major risks that organisations face in the quest for ensuring IT Business Value

The questions that were asked included:

- What are the factors that are required by organisations to ensure IT Business Value?
  
- What are the risks that organisations are facing in South Africa in ensuring IT Business Value?
  
- What is the focus of technology in South African organisations at present?

The following Chapter presents the methodology on how the research was approached and how the results obtained were validated.

## CHAPTER 4

### RESEARCH METHODOLOGY

#### 4.1 Introduction

The following chapter describes the research methodology used to develop an understanding of IT value contribution in South African organisations. The sample selection is described as well as the design of the questionnaire used to interview leading executives in the IT service provider industry.

This research report has as its basis a descriptive study. The objective of a descriptive study, according to Cooper and Schindler (1998), is to learn the *who, what, when, where* or *how much* of a topic. Some aspects of explorative studies are also used, especially the qualitative techniques of secondary data analysis and interviewing.

The following secondary data sources were used:

- Internet.
  - On line journals.
- Unisa Library.
- Gartner
- Forrester
- On line databases via UNISA

- Emerald Intelligence (MCB).
- General Business File (Gale).

## 4.2 *The Methodology*

The research methodology is based on and combines aspects of single case based research and triangulation.

In a reference to a case study definition, Oberholzer (1995:76), references the work of Yin as follows:

- *'Investigates a contemporary phenomenon within its real-life context: when*
  - *The boundaries between phenomenon and context are not clearly defined and in which*
  - *Multiple sources of evidence are used'.*

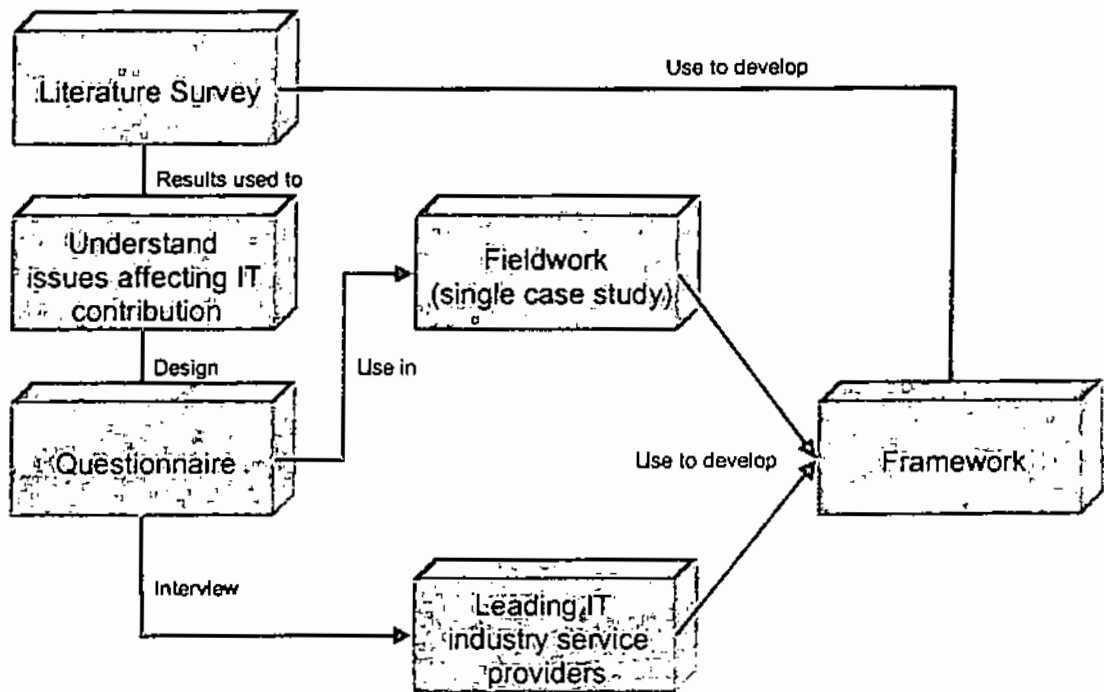
The existence of a good case organisation or person with extensive experience in the field of IT would allow for the concepts and framework derived from this report to be tested and evaluated.

The case study approach may be characterised as seeking (Yin, 1993:46);

- *'To define specific questions of study ahead of time*
- *To emulate logical positivism in developing rival hypotheses and collecting external evidence bearing on these questions*

- *To carry out fieldwork in a targeted fashion-that is focusing on the evidence deemed relevant and doing fieldwork in a time limited fashion'.*

Figure 16 illustrates the approach used in this research report.



**Figure 16 Research Approach**

An important point of this research is the concept of '*triangulation - a point in geometric space may be definitively established by specifying the intersection of three vectors*' (Yin, 1993:69). Based on this fact the research report extends this to the following. If the same question is asked of different sources of evidence; if all sources point to the same answer then you have successfully triangulated the data.

In their handbook on qualitative research editors Denzin and Lincoln (1994:214) identify four types of data triangulation:

- *'Data triangulation: the use of a variety of data sources in a study'*
- *'Investigator triangulation: the use of several different researchers or evaluators'*
- *'Theory triangulation: the use of multiple perspectives to interpret a single set of data'*
- *'Methodological triangulation: the use of multiple methods to study a single problem'.*

A combination of all four are used in this research report. Figure 17 illustrates the triangulation concept.

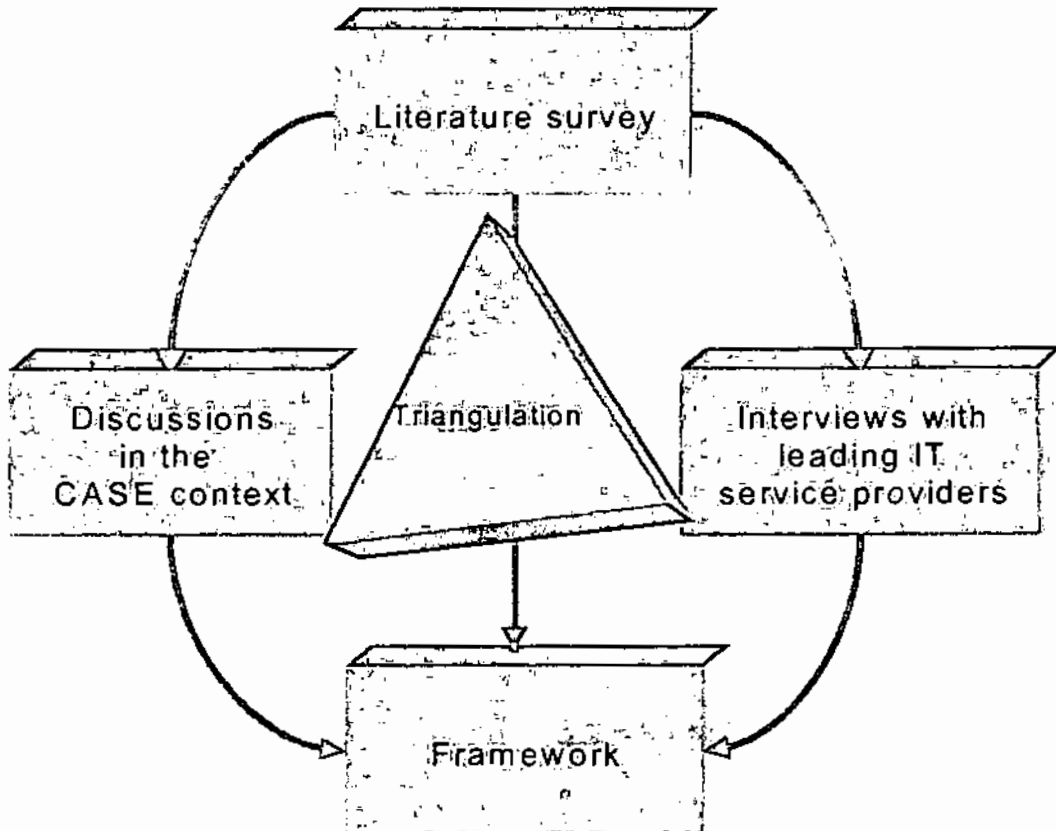


Figure 17 Triangulation Concept

### 4.3 Sample Selection

Table 3 below contains listed IT solution/service providers organisations on the JSE, ranked according to their market capitalisation. The information was taken from the Financial Mails' special survey of top companies for 1999. The table below contains a list of IT companies on the JSE.

	<b>IT Companies</b>	<b>Market Capitalisation (Rm)</b>
1	Dimension Data	18824,8
2	Comparex	16027,8
3	Datatec	9127,1
4	Sftline	3044,9
5	CCHold	2738,2
6	Ixchange	2077,4
7	MGX	1658,9
8	AST	1346,5
9	Usko	1187,2
10	Mustek	1055,7
11	Spescom	831,1
12	MBTech	816,8
13	Fintech	810,1

	IT Companies	Market Capitalisation (Rm)
14	Faritec	688,5
15	UCS	603,7
16	Spicer	599,5
17	Billcad	539,2
18	Abraxas	433,6
19	ITI-Tech	410,1
20	Siltek	404,6
21	DCentrix	378,4
22	Crux	368,8
23	Glotec	258,9
24	Imphold	237,0

**Table 3 Top IT Performers Based on Market Capitalisation (1999)**

Source: Financial Mail: Special Survey (1999)

The same report also has a category for 'Top Performers'. Companies are ranked according to the companies annual returns averaged over a five-year period. The sample of companies in this category are limited by the following factors;

1. Total assets must be large to have qualified for inclusion in the Top 300 ranking,
2. Their market capitalisation must exceed R100m, and
3. Companies need to have been listed for 5 years.

The following table (Table 4) lists those IT companies that qualified as a top performer.

	<b>IT Top Performers</b>
1	Dimension Data
2	Softline
3	Usko
4	Spescom
5	Fintech
6	Spicer
7	Siltek
8	Imphold
9	KTL

**Table 4 IT Top Performers**

Source: Financial Mail: Special Survey (1999)

Out of the total of 35 companies only 9 made the list (25.7%). These companies would warrant inclusion in a sample based on the following reasons:

- They qualify in terms of size as per criteria for inclusion in the Top Performer list, and
- Value must be seen as a medium to long term, i.e. sustainability.

These companies have shown value to would be investors so their services (IT solutions) must have delivered value to their customers.

The same report also has another sector for 'Market Leaders'. This list is ranked according to a companies market capitalisation and is limited to 150. The following table (Table 5) lists these companies (only the IT organisations are given in the list).

	<b>IT Companies</b>	<b>Market Capitalisation Rm</b>
1	Dimension Data	18824,8
2	Comparex	16027,8
3	Datatec	9127,1
4	Sftline	3044,9
5	CCHold	2738,2
6	Ixchange	2077,4
7	MGX	1658,9
8	Usko	1187,2

**Table 5 IT Market Leaders**

Source: Financial Mail: Special Survey (1999)

To exclude the management consulting (Appendix F) industry would be an error. This industry is considered to be worth about R4.5bn/year (Financial Mail Survey 1999).

The sample used in this research report is a combination of Table 4 and 5 with the addition of the management consultants. The sample used is shown in (Table 6).

	Organisation	Home Page URL
1.	Andersen Consulting	<a href="http://www.ac.co.za/">http://www.ac.co.za/</a>
2.	CCHold	<a href="http://www.cch.co.za/">http://www.cch.co.za/</a>
3.	Comparex	<a href="http://www.comparex.co.za/">http://www.comparex.co.za/</a>
4.	Datatec	<a href="http://www.datatec.co.za/">http://www.datatec.co.za/</a>
5.	Deloitte Consulting	<a href="http://www.deloitte.co.za/">http://www.deloitte.co.za/</a>
6.	Dimension Data	<a href="http://www.didata.co.za/">http://www.didata.co.za/</a>
7.	Ernst & Young	<a href="http://www.ey.co.za">http://www.ey.co.za</a>
8.	Gartner	<a href="http://www.gartner.com">http://www.gartner.com</a>
9.	Ixchange	<a href="http://www.ixchange.co.za/">http://www.ixchange.co.za/</a>
10.	KPMG	<a href="http://www.kpmg.co.za/">http://www.kpmg.co.za/</a>
11.	PWC	<a href="http://www.pwc.co.za/">http://www.pwc.co.za/</a>
12.	Siltek	<a href="http://www.siltek.co.za/">http://www.siltek.co.za/</a>
13.	Softline	<a href="http://www.softline.co.za/">http://www.softline.co.za/</a>
14.	Spescom	<a href="http://www.spescom.co.za/">http://www.spescom.co.za/</a>
15.	Usko	<a href="http://www.usko.co.za/">http://www.usko.co.za/</a>

Table 6 Sample Used

To get an even broader view of the industry, Gartner South Africa was also approached.

#### 4.4 Questionnaire

The following section describes the administration of the questionnaire, the design approach and the analysis approach adopted.

#### 4.4.1 Administration

Self-administered questionnaires were used for this research.

According to Cooper & Schindler (1998), self-administered questionnaires have become ubiquitous in modern living. They also state that returns of mail surveys of about 30% are often considered satisfactory, but instances of more than 70% response have occurred.

The delivery mechanism used was that of computer delivery i.e. e-mail. The top executives of the sample given in Table 6 were 'mailed'. An introductory letter was attached to each questionnaire sent out (see Appendix A). To maximise the mail survey, reminders were sent out a week after the original mail. This was followed up approximately three weeks later with a final reminder. The results were entered by hand into Microsoft® Excel.

No form of pretesting of the questionnaire was performed.

#### 4.4.2 Questionnaire Design Approach

This section describes the approach used for designing the questionnaire.

The questionnaire used the literature survey as its basis and was divided into four sections:

- **Section A: Current Technology Status.**

- This section was used to determine what current South African Organisations are focussing their attentions on regarding IT. A list of eight technologies was used. Respondents were asked to rank them according to priority of implementation needs:

- ◆ Business to Business Solutions
  
- ◆ Business to Consumer Solutions
  
- ◆ Call Centres
  
- ◆ CRM (Customer Relations Management)
  
- ◆ Datawarehousing
  
- ◆ EIS (Executive Information Systems)
  
- ◆ ERP (Enterprise Resource Planning)
  
- ◆ WAP (Wireless Application Protocol)

▪ **Section B: IT Departments.**

- This section was used to understand internal IT departments in terms of their capabilities, processes, leadership and structure. Questions also relating to how users of IT see their IT department were also asked. The questions were structured into the following key groups:

- ◆ Capabilities of IT personnel; respondents were asked to select, firstly from a given list of capabilities, and then to add any of their own not mentioned in the given list. The capabilities given were taken from the literature survey. It was found that some of the capabilities could also be seen as part of a core process of an IT department.

These were covered in questions B1 and B2.

- ◆ An open-ended question on what factors may impede organisations from having the identified capabilities was covered in question B3.

- ◆ Core processes of IT departments; respondents were asked to select, firstly from a given list of processes, and then to add any of their own not mentioned in the given list. These were covered in questions B4 and B5.

- ◆ A list of general questions related to IT department structure and ability to deliver value were asked in B6.

- B.6.1.1: Reporting line for a CIO.

- B.6.1.2: Location of an IT department (Centralised vs. Decentralised).

- B.6.1.3: The respondents view on internal IT departments ability to deliver value.
  - B.6.1.4: The respondents view on if the users of IT believe that internal IT departments can deliver value.
  - B.6.1.5: The respondents view on if users of IT understand there IT department.
  - B.6.1.6: The respondents view on if IT personnel should be rotated through the business so as to broaden their skills and understand the business.
- 
- **Section C: IT and Business Alignment.**
    - This section revolved around IT and business strategy. The aim here was to understand if South African organisations are integrating their business and IT strategies.
      - ◆ Question C1 described some high-level alignment steps between IT and business strategy and asked respondents if South African organisations performed any of these steps.
      - ◆ Question C2 consisted of general questions regarding IT strategy.
        - ◆ C.1.5: This question asked respondents if the majority of South African organisations had an IT strategy.
        - ◆ C.1.6/7/8: These questions revolved around the communication of the IT strategy.

- ◆ C.1.9: This question asked the respondent about the frequency of IT strategy reviews.
- ◆ C.1.10: This question asked for the respondents view on how IT strategy is viewed in organisations.
- ◆ C.1.11: The respondents view on whether South African organisations perform some form of business reengineering before implementing the IT solution.
- An open ended question on any points that a respondent wanted to add, that they felt to be important regarding IT and Business alignment.
- **Section D: Evaluation Tools and techniques.**
  - This section revolved around the use of methods in evaluating IT investments and the success that the respondents have experienced in using these methods.
    - ◆ The methods included are:
      - ◆ Business Case
      - ◆ Critical Success Factors
      - ◆ Game-Playing and role playing
      - ◆ Information Economics
      - ◆ Internal Rate of Return (IRR)
      - ◆ Multi-Objective, Multi-Criteria (MOMC) Method
      - ◆ Net Present Value (NPV)
      - ◆ Payback period
      - ◆ Profitability Index

- ◆ Prototyping
- ◆ Rate of Return or Return on Investment (ROI)
- ◆ Some form of Customer/User Involvement
- ◆ Value Analysis
- ◆ An open ended question asked whether there were any methods not mentioned in the previous list.

#### 4.4.3 Questionnaire Analysis Approach

Three of the four sections in the questionnaire had open-ended questions whereas the remainder were based on a rating scale.

In performing the open-ended analysis, each response was scanned and the first iteration concentrated on identifying similar keywords. Similar ideas were then grouped together under one all encompassing keyword.

For the remainder of the questions the following statistics (due to the small sample size) are given (the data set mentioned below references the data collected from all the responses of the questionnaire used for this research):

- Count: Indicates the number of responses obtained for that question.
- Maximum: The largest value for that question in the data set for a particular question.

- **Minimum:** The smallest value for that question in the data set for a particular question.
- **Mode:** The value listed most often in the data set for a particular question.
- **Range:** The largest value minus the smallest value representing the extent of the entire data set for a particular question.
- **Standard Deviation:** Summarises the typical distance from the average to each data value in the data set for a particular question.
- **Variance:** Provides the same information as the Standard Deviation. The smaller the value the lower the variance, the greater the variance the greater the dispersion of values in the data set for that particular question.

#### **4.5 Limitations**

A limitation of the general application of the framework developed in this research report is the fact that the research is based on a single CIO case perspective. For it to have wider acceptance more feedback from South African CIOs needs to be gathered.

The research has a bias towards the implementation of new IT systems. For it to be used in a broader sense more details on existing system management needs to be looked at.

## CHAPTER 5

### RESEARCH FINDINGS

#### 5.1 *Introduction*

The aim of this chapter is to present the statistics of the number of questionnaires sent out and received back as well as the findings from the questionnaires. Summaries of the various data from the IT service provider are provided in tabular format where appropriate. Where open-ended questions were used, a summary of the key points is given. The complete set, in 'raw format' can be found in Appendix H. The chapter concludes with the responses obtained from the CIO case study.

#### 5.2 *Questionnaire Response Summary*

The following is a summary of the number of questionnaires sent out and received back.

Total number of companies interviewed:	15
Total number of persons interviewed per company:	30
Average number of questionnaires per company:	2
Percentage of returns on a company wide basis:	60%
Percentage of returns on a interviewee wide basis:	50%

A good response rate was achieved, as the typical range as stated by Cooper & Schindler (1998) has been found to be between 30% and 70%. This could be attributed to the commitment of the IT industry in working towards IT value delivery and the target group, senior IT executives.

### **5.3 IT Service Provider Questionnaire Findings**

This section presents the findings of the questionnaire responses in summary format.

#### **5.3.1 Section B Findings - Current Technology Status**

The current technology status, from a service provider point of view was found to be as follows.

The scoring used was 'very important = 5', 'somewhat important = 3', or 'not at all important = 1'.

<b>Technology</b>	<b>Sum</b>	<b>Standard Deviation</b>	<b>Variance</b>	<b>Mode</b>
Call Centres	45	1.890	3.571	2
Business to Business Solutions	46	2.219	4.924	1

Technology	Sum	Standard Deviation	Variance	Mode
CRM	47	1.552	2.410	3
ERP Solutions	63	2.336	5.457	4
Datawarehousing	65	1.291	1.667	5
Business to Consumer Solutions	71	1.944	3.781	5
EIS	79	1.831	3.352	7
WAP technology	108	1.612	2.600	8

### 5.3.2 Section B Findings - IT Departments

- Question 1

Each of the following capabilities have been shown, according to the literature, to be important capabilities that personnel of an internal IT department should have. Using your own experience, for each factor please tell us whether you believe the factor to be 'very important', 'somewhat important', or 'not at all important.'

The scoring used was 'very important = 5', 'somewhat important = 3', or 'not at all important = 1'.

	Count	Min.	Max.	Range	Mode	Mean	Std. dev.	Std. error	Variance
<b>Business Systems Thinking</b>	15	1	5	4	5	4.333	1.234	0.319	1.524
<b>Interpersonal Skills</b>	15	3	5	2	5	4.200	1.014	0.262	1.029
<b>Technical Skills</b>	15	3	5	2	5	4.600	0.828	0.214	0.686
<b>Project Management</b>	15	3	5	2	5	4.733	0.704	0.182	0.495
<b>Relationship Building (With IT Users)</b>	15	3	5	2	5	4.200	1.014	0.262	1.029

- Question 2

If you believe that there are additional capabilities, then please provide these?

- Proactive Thinking
- Solution Engineering
- Industry Expertise
- Financial Management
- Flexibility
- Entrepreneurs
- Team Player

▪ Question 3

In your opinion are there any factors that may impede an organisation from having an IT department with all these capabilities?

- Critical mass to deliver the full scope of services. Most people enter the IT department as a start in their career development and as soon as they become technically competent and astute they tend to move on to other more challenging areas of the IT industry, i.e. consultant, management, where they can demand higher incomes etc. Thus most IT departments are generally staffed by young inexperienced personnel that are learning the ropes.
- Infrastructure and budgetary constraints.
- The resource pool is becoming smaller in SA and the skills gap between supply and demand is widening.
- Lack of understanding of the importance of IT within organisations.
- The right mix of people. However the difficulty may be having all of these skills in single individuals – many IT professionals with strong technical skills often lack the interpersonal touch – and those who combine these traits often gravitate to the supplier world.

- A misunderstanding of IT's role in an organisation, resulting in IT not performing its role as a business partner and the exclusion of IT from the strategic decision making within the organisation.
  - Effective HR Management i.e. lack of recruitment skills, up to date remuneration, rewarding and training.
  - No long term objectives.
  - Some organisations do not encourage innovation. They focus on operational issues and not on creating the future
  - Lack of inter-personal skills.
- 
- Question 4

Each of the following processes, according to the literature, can ensure successful IT contribution in an organisation. Using your own experience, for each factor please tell us whether you believe the factor to be 'strongly influential', 'somewhat influential', or 'not at all influential.'

The scoring used was 'very important = 5', 'somewhat important = 3', or 'not at all important = 1'.

	Count	Min.	Max.	Range	Mode	Mean	Std. Dev.	Std. error	Variance
Application Management	15	3	5	2	3	3.800	1.014	0.262	1.029
Configuration And Change Management	15	3	5	2	5	4.600	0.828	0.214	0.686
Contract Management and Facilitation	15	3	5	2	3	3.667	0.976	0.252	0.952
Disaster Recovery	15	1	5	4	5	4.067	1.280	0.330	1.638
Process Change Management	15	3	5	2	5	4.200	1.014	0.262	1.029
Project Management	15	3	5	2	5	4.733	0.704	0.182	0.495
Service Management	15	3	5	2	5	4.200	1.014	0.262	1.029
Standards Setting	15	3	5	2	3	3.667	0.976	0.252	0.952
Technology Management	15	3	5	2	5	4.600	0.828	0.214	0.686

- Question 5

If you believe that there are processes not mentioned in the list above, please provide these.

- Strategic planning
- Expectation Management

- Communication procedures
- Business assurance, i.e. making sure that the technology supports the business objectives
  - ◆ Business Designers
  - ◆ Business Integrators

Each of the following questions related to the delivery of effective IT in an organisation.

- Question 6.1.1

<b>Should the CIO (or similar) report to the ...</b>	<b>CEO (score =1)</b>	<b>CFO (score =3)</b>	<b>Other (score = 5)</b>
--	---------------------------	---------------------------	------------------------------

Count	Min.	Max.	Range	Mode	Mean	Std. Dev.	Std. error	Variance
15	1	1	0	1	1	0	0	0

Main Additional Comments: Makes business sense for IT to interact directly with the CEO.

▪ Question 6.1.2

<b>Should the IT department be...</b>	<b>Centralised (score =1)</b>	<b>Decentralised (score =3)</b>	<b>Depends (score = 5)</b>
---------------------------------------	-----------------------------------	-------------------------------------	--------------------------------

Count	Min.	Max.	Range	Mode	Mean	Std. Dev.	Std. error	Variance
15	1	5	4	5	1	3.667	1.799	3.28

Main Additional Comments: Base it on the type of organisation.

▪ Question 6.1.3

<b>Do you believe that Internal IT departments have the ability to deliver IT value...</b>	<b>Not at all (score =1)</b>	<b>Somewhat (score =3)</b>	<b>Strongly Agree (score = 5)</b>
--	----------------------------------	--------------------------------	---------------------------------------

Count	Min.	Max.	Range	Mode	Mean	Std. Dev.	Std. error	Variance
15	0	3	3	3	1.867	1.457	0.376	2.124

Main Additional Comments: They should know the systems of the organisation the best. IT departments also need to change the way they are thinking, planning and executing their roles, and act within the parameters that are set by the business.

▪ Question 6.1.4

<b>Do users typically view IT departments as adding value?</b>	<b>Not at all (score =1)</b>	<b>Somewhat (score =3)</b>	<b>Strongly Agree (score = 5)</b>
--	----------------------------------	--------------------------------	---------------------------------------

Count	Min.	Max.	Range	Mode	Mean	Std. Dev.	Std. error	Variance
15	1	5	4	3	2.467	1.187	0.307	1.410

Main Additional Comments: This is an area that is easily criticised.

Some pointers to consider would be:

- Improve user education through channels that enable valued contribution and training
- Improve the interpersonal skills of IT staff. It's a factor of the marketing ability of the CIO and his team, as well as their understanding of the business value of IT. Depends on the companies focus and technology maturity

▪ Question 6.1.5

<b>Do users understand the technical staff?</b>	<b>Not at all (score =1)</b>	<b>Somewhat (score =3)</b>	<b>Strongly Agree (score = 5)</b>
---	----------------------------------	--------------------------------	---------------------------------------

Count	Min.	Max.	Range	Mode	Mean	Std. Dev.	Std. error	Variance
15	1	3	2	3	2.333	0.976	0.252	0.952

Main Additional Comments: They shouldn't have to! In the past IT solutions did not focus on applications alignment with the business strategy as the IT department attempted to impress by showing off their superior technical skills.

▪ Question 6.1.6

<b>Do you believe that IT staff should be rotated through functional departments?</b>	<b>Not at all (score =1)</b>	<b>Somewhat (score =3)</b>	<b>Strongly Agree (score = 5)</b>
---	----------------------------------	--------------------------------	---------------------------------------

Count	Min.	Max.	Range	Mode	Mean	Std. Dev.	Std. error	Variance
15	1	5	4	3	3.267	1.486	0.384	2.210

Main Additional Comments: In certain functions, cross-pollination adds value and builds in redundancy. Not as a general rule: -yes to the analysts and managers; no to the 'Techies'. Certainly Relationship Managers should work very close with the business.

5.3.3 Section C Findings - IT and Business Alignment

- Question 1

The following is a suggested, high level, approach for aligning business and IT. Using your own experience from organisations, indicate in the space provided whether you believe that 'most', 'some', or 'none', perform these high level steps

The scoring used was 'most = 5', 'some = 3', or 'none = 1'.

	Count	Min.	Max.	Range	Mode	Mean	Std. Dev.	Std. error	Variance
<b>Organisations identify breakthrough objectives that would achieve competitive advantage for the customer</b>	15	1	5	4	3	3.267	1	0.267	1.067

	Count	Min.	Max.	Range	Mode	Mean	Std. Dev.	Std. error	Variance
<b>Process and Information models are drawn to ensure consensus, communication and identifying enabling technology</b>	15	1	5	4	3	3.267	1	0.267	1.067
<b>Standards are defined that do not limit but improve technology exchangeability and are likely future trends</b>	15	1	5	4	3	3.267	1	0.267	1.067
<b>Solution mapping is performed by matching process and information models with new or existing technology solutions</b>	15	1	5	4	3	3.267	1	0.267	1.067

- Question 2

General questions on the topic of IT and Business alignment. The scoring used was 'most = 5', 'some = 3', or 'no = 1'.

	Count	Min.	Max.	Range	Mode	Mean	Std. Dev.	Std. error	Variance
<b>Do most organisations have a Technology strategy?</b>	15	1	5	4	3	3.4	1.121	0.289	1.257
<b>Is this strategy communicated to the Board?</b>	15	1	5	4	3	2.467	1.187	0.307	1.410
<b>Is this strategy communicated to all relevant stakeholders?</b>	15	1	5	4	3	2.467	1.187	0.307	1.410
<b>Is this strategy communicated to the entire organisation?</b>	15	1	3	2	1	1.133	0.516	0.133	0.267
<b>Is the Technology Strategy reviewed often</b>	15	1	5	4	3	2.333	1.234	0.319	1.524
<b>Indicate how many times per year</b>	1.5								
<b>Are the business and technology strategies held in the same regard?</b>	15	1	3	2	1	1.4	0.828	0.214	0.686
<b>Are most IT</b>	15	1	5	4	3	2.6	1.121	0.289	1.257

	Count	Min.	Max.	Range	Mode	Mean	Std. Dev.	Std. error	Variance
implementations preceded by some form of process reengineering exercise?									

- Question 3

If you have further comments regarding IT and Business alignment, please provide these.

- Most organisations do not really have a formal IT strategy.
- In my experience many medium sized companies still relegate IT to reporting into Finance, or if not, as a second rate function without Board status. This especially leads to misalignment between the business and IT.
- The IT strategy cannot be considered as a separate entity from the Business Strategy.
- IT needs to continuously address ways of measuring its performance.
- The gap between business and IT is getting smaller, but the traditional view of IT as a 'burden' is still prevalent. As new companies and markets emerge that are technology dependant,

organisations are beginning to structure themselves to include IT in the entire decision making process.

5.3.4 Section D Findings - Evaluation Tools and Techniques

Each of the tools and techniques mentioned below can be used to evaluate IT investments. The first column asks if organisations have used this tool or technique, while, the second column asks if the implementation proceeded according to the output of the tool or technique. As an example, if the system implemented promised a Return on Investment of 10%, was this achieved?

	Have Used Count	Have Used Percentage	Desired Result Count	Desired Result Percentage	Correlation Between Have Used and Desired Result
<b>Business Case</b>	11	73.3%	9	60.0%	73.9%
<b>Critical Success Factors</b>	13	86.7%	10	66.7%	55.5%
<b>Game-Playing and role playing</b>	0	0.0%	0	0.0%	0.0%
<b>Information Economics</b>	3	20.0%	0	0.0%	0.0%

	Have Used Count	Have Used Percentage	Desired Result Count	Desired Result Percentage	Correlation Between Have Used and Desired Result
Internal Rate of Return (IRR)	7	46.7%	4	26.7%	64.5%
Multi-Objective, Multi- Criteria (MOMC) Method	1	6.7%	1	6.7%	100.0%
Net Present Value (NPV)	6	40.0%	3	20.0%	61.2%
Payback period	11	73.3%	7	46.7%	56.4%
Profitability Index	5	33.3%	2	13.3%	55.5%
Prototyping	11	73.3%	8	53.3%	64.5%
Rate of Return or Return on Investment (ROI)	8	53.3%	4	26.7%	56.4%
Some form of Customer/User Involvement	13	86.7%	10	66.7%	55.5%
Value Analysis	9	60.0%	4	26.7%	49.2%

#### **5.4 CIO Questionnaire Findings**

Due to a single case study being used no statistical analysis was performed on the data.

The CIO single case study findings can be found in the following appendixes:

- Appendix C: CIO Details.
- Appendix D: Raw Data from CIO Case Fieldwork.
- Appendix H: Raw Respondent Data (includes IT Service Providers and CIO responses, the CIO responses were not grouped with the IT service provider results).

## CHAPTER 6

### ANALYSIS

#### 6.1 *Introduction*

This chapter analyses the findings presented in Chapter 5. The results of both the service provider and CIO interview are combined and input from the literature survey is used in formulating opinions and conclusions.

#### 6.2 *Analysis of Results*

##### 6.2.1 Section A Analysis - Current Technology Status

The results given in section 5.3.1 indicate that Call Centre technology is top of the list. WAP technology being bottom on the list of priorities in terms of what is being implemented currently in South African organisations.

The top two ranked technologies are fairly close, with Call Centres having the higher priority but a mode of 2. Whereas Business to Business Solutions having the slightly lower priority but a mode of 1.

The ranking is left as is as the variance of Business to Business Solutions is larger than the variance for Call Centres.

In a report by the IDC (1999a) the growth of the Call Centre market in South Africa is forecasted as 10% CAGR from 1998 to 2003, and a forecasted market size of R800m.

Regarding Business to Business solutions in the Financial Sector, IDC (1999b) see the market size value in 1999 at R538m and growing to a forecasted value of R1, 493m in 2004. Interestingly the same report states that the Business to Consumer market size in 1999 to be R78m, and is forecasted to grow to an amazing R2, 584m in 2004.

Customer Relationship Management represents another large market. In a report from the IDC (2000) they state that the current South African market size is R788.7m and to grow to a forecasted value of R3, 847,7m by 2004. This represents a CAGR of 26.

ERP solutions at this point are in a status quo. With the majority of the vendors deciding on how to integrate CRM to their functionality as well as eCommerce type functionality. Old-fashioned ERP systems are on the way out. In an article by JD Edwards in the IT Web (2000a) they state the following *'Enterprise resource planning (ERP), which was once touted as the answer to the enterprise's IT needs, no longer survives in its historical form'*. The same article refers to the market as being saturated.

WAP technology according to Forrester in an IT Web article (2000b) will only take off in 2005. The common reason given is the '*pedestrian speeds of GSM*'. This should change with the arrival of GPRS (general packet radio switch) and third generation (3G) networks expected in the next few years.

Not much detail information was found in the literature regarding EIS and Datawarehousing in their purest forms.

Comparing the IT service providers and the CIO case study the following can be said.

Technology	IT Service Provider Ranking	CIO Case Study Ranking
Call Centres	1	3
Business to Business Solutions	2	4
CRM	3	1
ERP Solutions	4	5
Datawarehousing	5	6
Business to Consumer Solutions	6	2
EIS	7	7
WAP technology	8	8

The results have a close correlation in most cases. WAP and EIS were exactly the same. A comment from the case study was that there are

only 25000 WAP enabled cell phones in South Africa, indicating a very small market segment. Business to Consumer had quite a difference, a ranking of 6 from the IT service providers and a ranking of 2 from the case. This can be explained as being unique to the case studied as a major effort is being put into 'reaching the customer' via their product lines. This then also explains the usage of CRM and Call Centres in the top three.

The results seem to correlate. To lend further credibility more CIOs would need to be interviewed.

## 6.2.2 Section B Analysis - IT Departments

- **Capabilities and Processes**

This section list the capabilities and processes that an IT department should have, based on the findings as given in Chapter 5. It also highlights the factors that can impede IT departments from adding value.

From the results presented in Section 5.3.2 regarding the capabilities of an IT department all the capabilities listed high ratings of a mode of 5 (very important) and variances of around 1 and 0.5. Taking these and the suggested list of capabilities (shown

in Italics), the following is a list of capabilities that an IT Department should have:

- Business Systems Thinking
- Interpersonal Skills
- Technical Skills
- Project Management
- Relationship Building (With IT Users)
- *Proactive Thinking*
- *Solution Engineering*
- *Industry Expertise*
- *Flexibility*
- *Entrepreneurship*
- *Business Designers and Integrators.*
- *Team Player*
- *Selling Skills (input gathered from CIO Case Study)*

Factors affecting IT departments from achieving these capabilities revolve around retaining staff, especially in a corporate environment - the best are attracted to work for the leading IT service providers as the rewards, training are perceived to be better. Also their focus is IT! Budgetary constraints also prevent organisations from paying IT personnel equivalent salaries as in the 'service provider' industry. The opportunity to work on state of the art technology and processes also add to this.

The other factor is that IT and the business need to function as a single unit. Historically there are divisions between IT departments and IT users. These divisions need to be broken down. The change needs to come from the top management level of organisations. CIO's, no matter how skilled, need the respect, authority and support of their boards.

From the results presented in Section 5.3.2 regarding the processes required by an IT department the following was found. The majority of capabilities listed in the question obtained a Mode of 5 (very important) and variances of around 1 and 0.5. Two processes, Application Management and Contract Management and Facilitation achieved a Mode of 3 (somewhat important). None of the listed processes received a Mode of 1 (no importance). A list of required processes is given below (includes the suggested processes in *Italics*):

- Application Management
- Configuration and Change Management
- Contract Management and Facilitation
- Disaster Recovery
- Process Change Management
- Project Management
- Service Management
- Standards Setting

- **Technology Management** (management of hardware, operating systems software, and telecommunications)
  - ***Strategic Planning*** (definitely part of Application Management)
  - ***Expectation Management*** (could be part of Service Management)
  - ***Communication Procedures*** (could be part of Service Management)
  - ***Solution Engineering*** (*input from CIO Case study, emphasising the fact that the solution has to meet the business need and also be technically sound, not necessarily the latest technology*)
- 
- **Structural Issues and User Perceptions of IT**

An overwhelming response from respondents and the CIO case study showed that a CIO must report to the CEO.

Regarding the location of the IT department, i.e. centralised, decentralised or depends, the trend hovered around decentralised and depends. The CIO case study indicated that IT should be centrally controlled, but with distributed operations based on the needs of the distributed locations.

The variance was fairly large (3.28) so this is still a debatable issue. The solution most probably is, 'depends' on. A possibility is to centralise certain core standards and technology choices and allow distributed parts of the company to use these in exploiting IT to meet their business needs. Control becomes an issue when decentralisation exists and can be expensive to monitor as the products available from vendors such as IBM (Tivoli®) and Computer Associates (Unicenter TNG) are expensive for medium to small organisations if the complete solution is required.

Due to the problems with retaining personnel (as mentioned previously) most respondents felt that IT departments did not have the ability to deliver value. A mean of 1.867 was achieved falling between 'Not at all' (score of 1) and 'Somewhat' (score of 3). The variance was 2.124.

The CIO case study felt strongly that IT departments can add value. This can be achieved via close partnerships with third party IT service providers. Certain non core activities of an IT departments should be outsourced, especially networking (eg WAN management) and desktop repairs. The CIO case study further stated that access to these IT service providers provided IT departments with much needed information on the latest trends in IT. Typically IT departments are down in the trenches dealing with operational issues and not strategic issues. Based on these

comments an assertion that needs to be verified is that whether with relationships between IT departments and IT service providers, IT departments can deliver value. The IT department will only have non core activities outsourced and have input on strategic issues and special projects.

User perceptions of IT departments reflects the findings found in the literature survey. A mean of 2.467 was achieved also falling between 'Not at all' (score of 1) and 'Somewhat' (score of 3) and a variance of 1.410. A huge effort has to be put in marketing the IT department. The work of the CIO in this area can be difficult without the support of the CEO and the board. Improving the skills, especially interpersonal skills, of the IT department personnel will go a long way in resolving the problem.

Regarding the language that IT personnel use, consisting of a multitude of three letter acronyms, the respondents felt that users do not understand IT personnel. A mean of 2.333 was achieved, falling between 'Not at all' (score of 1) and 'Somewhat' (score of 3). The variance was 0.952. Effective interpersonal skills for IT department personnel as well as some training for IT users is required. Both parties need to contribute here. From the CIO case study a definite point was that CIOs need to educate IT users on IT issues, terminology and processes. This was seen as a key responsibility of a CIO.

The question to rotate staff through functional departments had a mean of 3.267 and a variance of 2.210. This seems to indicate that it may help IT departments in adding value but it should be limited to analysts and managers. Letting purely technical specialist loose may be disastrous. Managers, service support and help desks personnel would definitely benefit from such a process, though it isn't seen as a must do. This was also supported by the CIO case study.

### 6.2.3 Section C Analysis - IT and Business Alignment

The question aligning IT and Business, used four generic high-level process steps derived from the literature survey, and asked the respondents if these were been followed by organisations. The common response was that 'some of' the organisations were following these steps. By implementing these generic steps a move towards achieving IT business value could be achieved.

The CIO case findings echoed these results with a slight difference in that process and information models are not drawn up to ensure consensus. The comment here is that if they are drawn up they are not at all shown to the users, as they do not understand them. This ties into the previous comment that the IT users need to be educated on the tools and techniques used by the IT department.

This question was followed on by some general questions on IT and Business Strategy.

It seems that not all organisations have a Technology Strategy in place. If they have the strategy, it is communicated to the board and relevant stakeholders. But more than often it is not communicated to the entire organisation. Typically the business strategy is communicated to the entire organisation. As technology is an enabler, its about time that it also occupies a slot on the company wide feedback agenda.

Respondents indicated that the technology strategy is typically reviewed once a year. Seeing that technology changes at such a rapid rate this should be increased to at least four times a year or better still related to industry trends or technological breakthroughs.

A disturbing result, but not a surprise, was that respondents felt that organisations still do not see the Business and Technology Strategy in the same regard.

Another disturbing result was that most IT implementations are not preceded by some form of process reengineering. IT affects processes, if organisations did not understand them before the implementation, they definitely will not afterwards. This may explain why IT has achieved a reputation of not been able to deliver on expected

promises. IT forms part of a system; people, processes and structures, roles etc. are changed when new systems are introduced. Some form of process reengineering definitely needs to be performed.

General comments by the respondents on IT and Business alignment indicated that there needs to be alignment and that the gap is getting smaller. An important point made by one of the respondents was that benefits need to be measured.

Here the CIO case study was more negative, as indications according to his experience were that very few (almost none) have a technology strategy, and have no business alignment etc. This would tie into the general perception that IT is not contributing to the organisation's success. Having an IT strategy is definitely a key factor. Analysis of the CIO case study also indicated that if no funding was given to the IT department no strategic planning could be performed. This resulted in some IT managers 'putting in fat' in other parts of their budget to attempt to buy some strategic consulting from IT service providers. The problem with such an approach is that it is hidden and can easily backfire on the CIO.

#### 6.2.4 Section D Analysis - Evaluation Tools and Techniques

The most popular methods used for evaluating IT implementation benefits are:

- Critical Success Factors (86.7%)
- Some form of Customer/User involvement (86.7%)
- Business Case (73.3%)
- Payback Period (73.3%)
- Prototyping (73.3%)

Mildly popular methods used include:

- Value Analysis (60.0%)
- Rate of return, or Return on Investment (53.3%)
- Internal rate of Return (46.7%)
- Net present value (40.0%)
- Profitability index (33.3%)

Least Popular:

- Information Economics (20%)
- Multi Objective, Multi Criteria (MOMC) (6.7%)
- Game Playing and role playing (0%)

The most successful methods were (based on a success of 70% or greater):

- Multi Objective, Multi Criteria (MOMC) with a 100% success rate but not a popular method.
- Business Case with a 73.9% success rate.

Methods with a zero success rate consisted of:

- Information Economics
- Game Playing and role playing

The remainder of the methods had average success rates of between 49.2% and 64.5%).

From the CIO case study no success regarding the use of the business case was achieved. Success in usage of the following methods was obtained: Critical Success Factors, Game-playing and role-playing, Payback, Return on Investment, Customer involvement and Value analysis. After some discussion it turned out that the use of a Business Case did not contain the same amount of detail as discussed in this research. It was also felt that by using the approach given in this report (Remenyi, 1999), the required results could be obtained as the *'financial tools'* used by the organisation would form part of the Business Case anyway.

## CHAPTER 7

### ENSURING IT BUSINESS VALUE FRAMEWORK

#### 7.1 Introduction

This chapter presents the first attempt at a framework that can be used by South African organisations to ensure the successful delivery of IT business value in their respective organisation. It is based on the assumption that the organisation has an internal IT department.

The literature survey, service provider responses and input from a CIO was used in the formulation of this framework.

#### 7.2 The Framework

A framework can be defined as

*'a microarchitecture that provides an incomplete template for systems within a particular domain',*

Jacobson, Booch and Rumbaugh (1999:445).

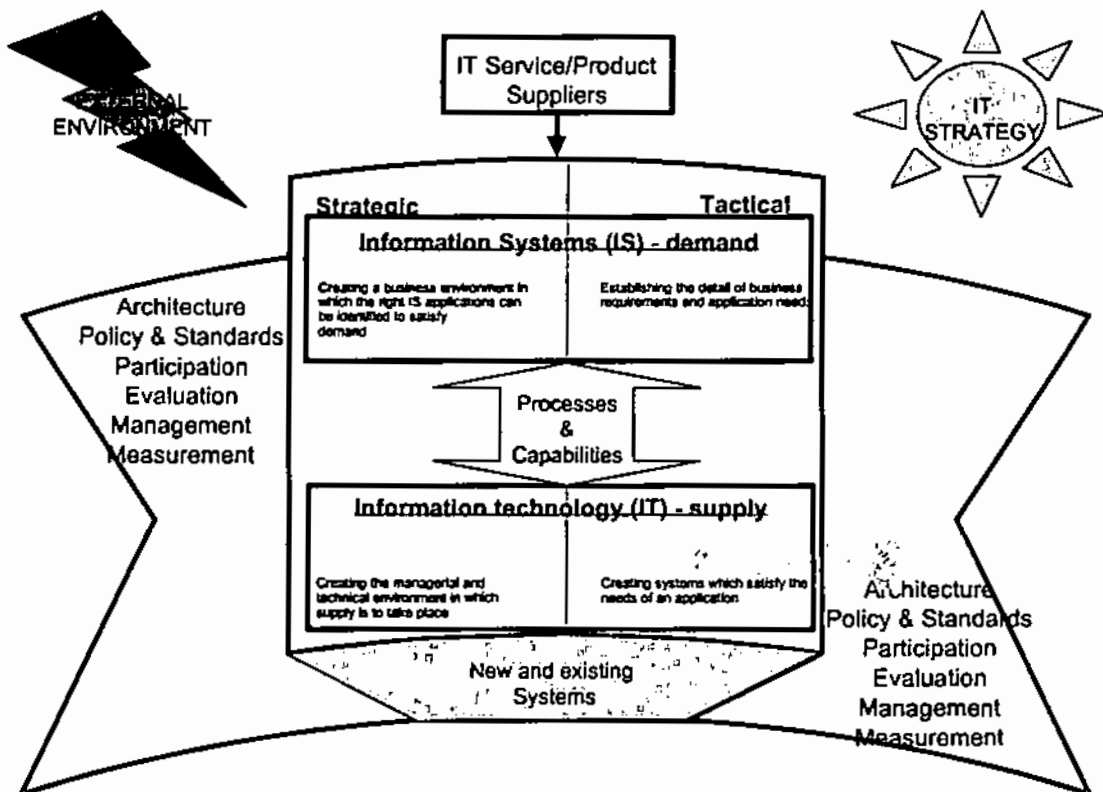
The Pocket Oxford Dictionary defines a framework as a *'sub structure'* and *'established order'*.

Remenyi (1999:195) defines a framework as follows

*'It is a fundamental structure for a system of ideas where a structure is the number of parts that are put together in a particular way.'*

It is within this context that the framework was derived.

Figure 18 provides a pictorial view of the framework.



**Figure 18 Conceptual IT Value Framework**

Source: Based on Edwards, Ward, Bytheway (1995:3)

### 7.2.1 External Environment

The external environment depicts the forces that IT departments would be affected by, and need to take cognisance of. The external environment consists of:

- Government
- Suppliers
- Customers
- Competitors
- Economic Factors
- Social Factors
- Political Factors

Depicted by a lightning bolt these factors can cause havoc. Taking the parallel further. During a thunderstorm common sense is required (i.e. stay out the rain) and protection in the form of lightning protectors are used. In the IT world common sense will also always be required, unfortunately it cannot be taught, but mostly comes with experience. However '*protection*' can found in the form of the following components of the framework as indicated in Figure 18.

### 7.2.2 IT Strategy

The IT strategy is seen as the guiding light. It is not separate from the business strategy. It should be reviewed at a minimum, at the same

time the Business Strategy is reviewed or as dictated by an event or happening in the External Environment. Part of the strategy should be scenario planning. Predictions about the future need to be looked at and possible implications of those predictions on current decisions need to be made.

Inputs to the IT strategy include:

- Business Strategy
  - Business to Technology decomposition. See Figure 10 in section 2.3.3. The business strategy must have a breakdown of each critical success factor of the business and how they are addressed by IT. See Figure 19.

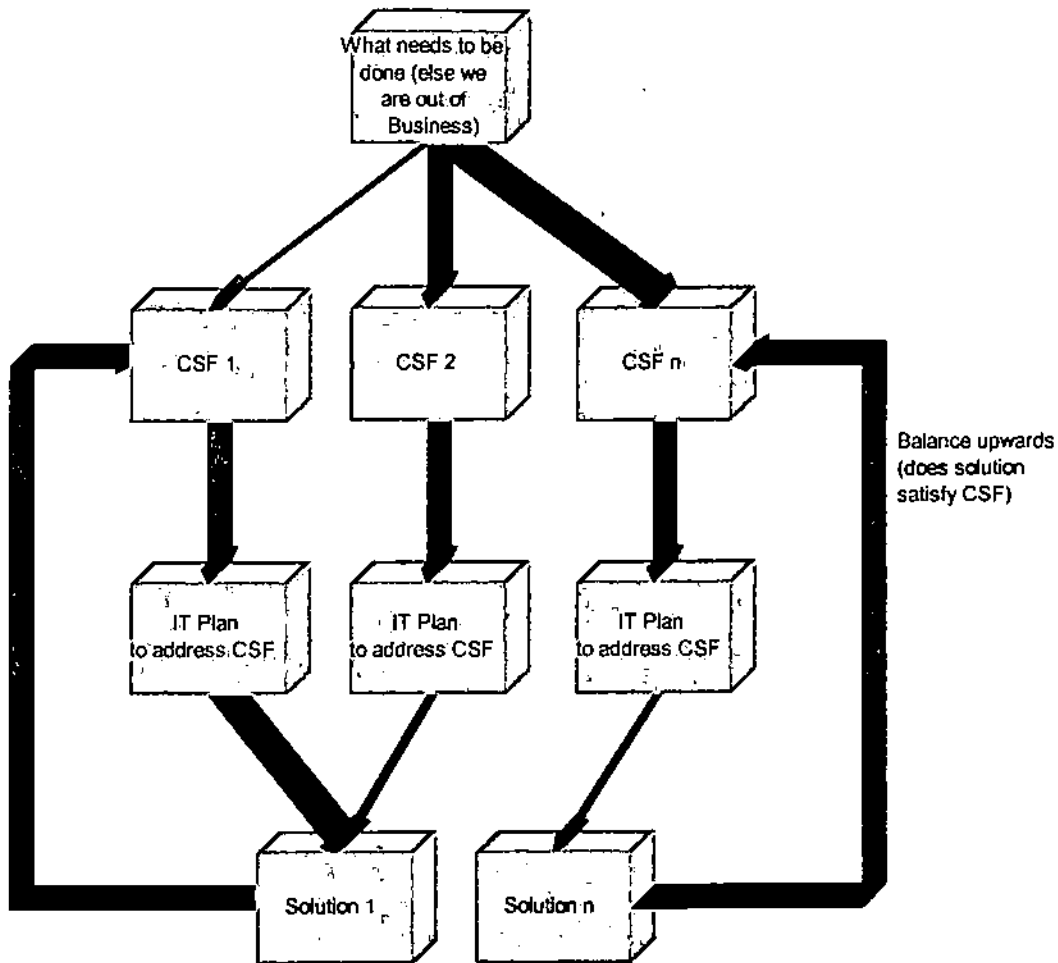


Figure 19 Business Objective to IT Plan Mapping

- External Factors
- Education
  - Concentrate on programs to prepare users of IT for the impending (and current) IT systems. The IT Business alignment needs to be clearly explained. Processes and terminology used also features here.
- Approach to Business Process Reengineering

- Although more of a company wide policy concern, the need for an understanding of the consequences of process reengineering is required i.e. re-skilling, retrenchments etc.
- IT Department Considerations
  - Structure
  - Strengths and Weaknesses
  - Budget
  - Infrastructure

### 7.2.3 Ribbon Topics

The '*ribbon effect*' as depicted in Figure 18 illustrates that all operations and actions taking part in the IT department, need to take cognisance of the following factors:

- **Architecture**
  - The entire IT basis must be driven from an architectural viewpoint. By using this approach, growth, long term planning with short-term benefits can be designed into the systems and achieved. The following architectures are considered to be a minimum that an organisation should have:
    - *Systems Architecture*: Definition of the systems and technology platforms in use within the enterprise.
    - *Data Architecture*: Definition of the data that support the business functions defined in the business model.

- *Applications Architecture*: Definition of the major kinds of applications needed to manage the data and support the business functions of the enterprise. It is a definition of what the applications will do to manage data and provides information to people performing business functions.
- *Technology Architecture*: Defines the major kinds of technology needed to provide an environment for the applications that are managing the data.
- *Process Architecture*. Definition of all processes including the workflow.
  
- **Policy and Standards**
  - Clear policy and standards need to be in place so as to bring order in the organisation. These standards should be balanced between having too many (standing the risk of possibly stifling innovation) and too few (environment becomes difficult to manage). A list of typical policy and standards that should be used is given next:
    - ◆ Security standards (physical and logical)
    - ◆ Hardware Standards
      - Desktop
      - Servers
      - Networking Equipment
    - ◆ Software Standards

- Productivity Software (e.g. Microsoft, Lotus office software)
- Business applications
- ◆ Networking Equipment
- ◆ Procurement Policy
- ◆ Backup Policy
- ◆ Use of external parties
  - Consultants
  - Contractors
  
- **Participation**
  - The aim of this function is to ensure that all stakeholders are identified and are part of any solution. Communication should be on a regular basis and have the following forms:
    - ◆ General
      - Could be via email, company newsletter, notice board and company wide feedback sessions.
    - ◆ Specific
      - Involvement in steering committee focus groups and appropriate meetings.
    - ◆ IT Steering Committee
      - This should be a formal group of senior executives that discuss and review the IT strategy within the context of the Business Strategy, external and internal environment.

- ◆ Language
  - The language used should adopt the thinking behind the post modern approach to management as is described in section 2.3.4.
  
- **Evaluation**
  - A formal method for evaluating IT investments should be adopted and used by the organisation. Based on the findings of this research the following method is recommended:
    - ◆ Business Case (the business case seems by far the best approach as it combines various elements). The typical elements of a Business Case include (Remenyi,1999)
      - Business Outcomes. The business result of the IT after it has been implemented successfully.
      - Stakeholders. Any individual with an involvement with IT or the IT solution being developed.
      - Technology. Reflects the challenges and risks of the technology being used.
      - Strategic alignment. Answers the question '*Does the IT system or investment support the organisation's strategy*'.
      - Risk - Project and systems. A review of the risks that can be encountered. There are three categories; business risk, development risk and architectural risk.
    - ◆ Remenyi (1999:195) encourages the used of formative evaluation '*Formative evaluation is an iterative evaluation*

*and decision making process, continually influencing decisions about the information system's development process and the resulting information system'. This process establishes a process by which the achievement of project objectives is obtained.*

- ◆ A framework as discussed in section 2.4, like Figure 12, can be used to match the evaluation method to the project.

- **Management**

- This topic refers to the management of the IT department and the role of the CIO. Key points in this area include:

- ◆ The CIO must report to the CEO. The role and responsibilities of a CIO include:
  - Policy determination
  - Procurement
  - Strategic planning
  - Results management
  - Process Improvement
  - Business Case development
  - Leadership
  - Technology Assessment
  - Security
  - Architectures
- ◆ Joint development (with HR) of reward and remuneration strategies

- ◆ Training
  - ◆ Effective communication (as indicated in section 2.3.4).
- 
- **Measurement**
    - Clear metrics must be identified and communicated to the organisation. A typical tool here could include the Balanced Scorecard.

#### 7.2.4 The Core

The core of the framework presented in Figure 18 makes use of concepts like supply and demand. Besides the findings obtained during this research this section is also based on the concepts identified in the book *'The Essence of Information Systems'* by Edwards, Ward and Bytheway (1995).

They state the following;

*'Strategy is concerned with managing demand, and optimising the benefits that new applications will provide; tactics are about managing supply, and optimising the cost of development and operations'*,

(Edwards, Ward and Bytheway, 1995:4)

An example of Strategic IS would be:

- An organisation is contemplating a Business to Business solution with one of its suppliers. They feel that by having such a system in place, both organisations could benefit due to improved and accurate scheduling of deliveries and thus enhance the relationship between the two parties.

An example of Strategic IT would be:

- Continuing the previous example. This would relate to a decision on how to supply the particular solution. A decision regarding who would provide the network infrastructure and manage it needs to be taken. That is, outsource via a network service supplier or use the dedicated digital leased lines managed by the internal IT department.

An example of Tactical IS would be:

- Before rushing out and designing a new application or buying an off the shelf package the requirements that the system needs to meet need to be identified. All the involved stakeholders, the two organisations involved, Unions (may involve cutting down on costs - require fewer administration clerks) network service provider and the post and telecommunications authority need to be informed and consulted with. The various architectures that were mentioned earlier are captured or earlier ones modified.

An example of Tactical IT would be:

- The issue of purchasing, implementing and using the new system need to be considered here. One of the questions that could be asked in this phase would include, *'Are there any changes to the existing systems?'*

### 7.2.5 Capabilities Required by IT Department Staff

This section lists the capabilities required by an IT Department and a indication on the role that should have the capability:

Capability	Required By Whom
Business Systems Thinking	Senior Staff Junior staff to be mentored by senior staff
Interpersonal Skills	Entire department, with more competence as one moves up the seniority scale. The CIO and senior managers need to be politically aware as well.
Technical Skills	The following areas would need to be covered: <ul style="list-style-type: none"> <li>▪ Hardware (desktops, servers etc)</li> <li>▪ Software (office applications, ERP etc)</li> <li>▪ Telecommunications (routers, internet etc)</li> <li>▪ GroupWise applications</li> </ul>

Capability	Required By Whom
	The CIO would need to have general skills in all of these areas.
Project Management	Limited to specialist in department, and only if the organisation has taken the decision to do this task.
Relationship Building	Entire department, with more competence as one moves up the seniority scale.
Proactive Thinking	Entire department, with more competence as one moves up the seniority scale.
Solution Engineering	Entire department, with more competence as one moves up the seniority scale.
Industry Expertise	Entire department, with more in depth knowledge as one moves up the seniority scale.
Financial Management	CIO and senior management.
Flexibility	Entire department, with more competence as one moves up the seniority scale.
Entrepreneurship	Mainly led by CIO - but encouraged within department via mentoring
Business Designers and Integrators.	Entire department, with more competence as one moves up the seniority scale. Even network administrators need to start to understand the impact on the business , eg. online shopping (open 24hrs) and

Capability	Required By Whom
	traditional methods (open 8hrs).
Team Player	Entire department, with more competence as one moves up the seniority scale.

7.2.6 Processes Required by IT Department Staff

This section lists the processes required by an IT Department:

- Application Management
- Configuration And Change Management
- Contract Management and Facilitation
- Disaster Recovery
- Process Change Management
- Project Management
- Service Management
- Standards Setting
- Technology Management
- Process Improvement
- Procurement

7.2.7 Detailed IT Value Framework

This section provides an updated framework by summarising all the previous points into one picture for easier reference.

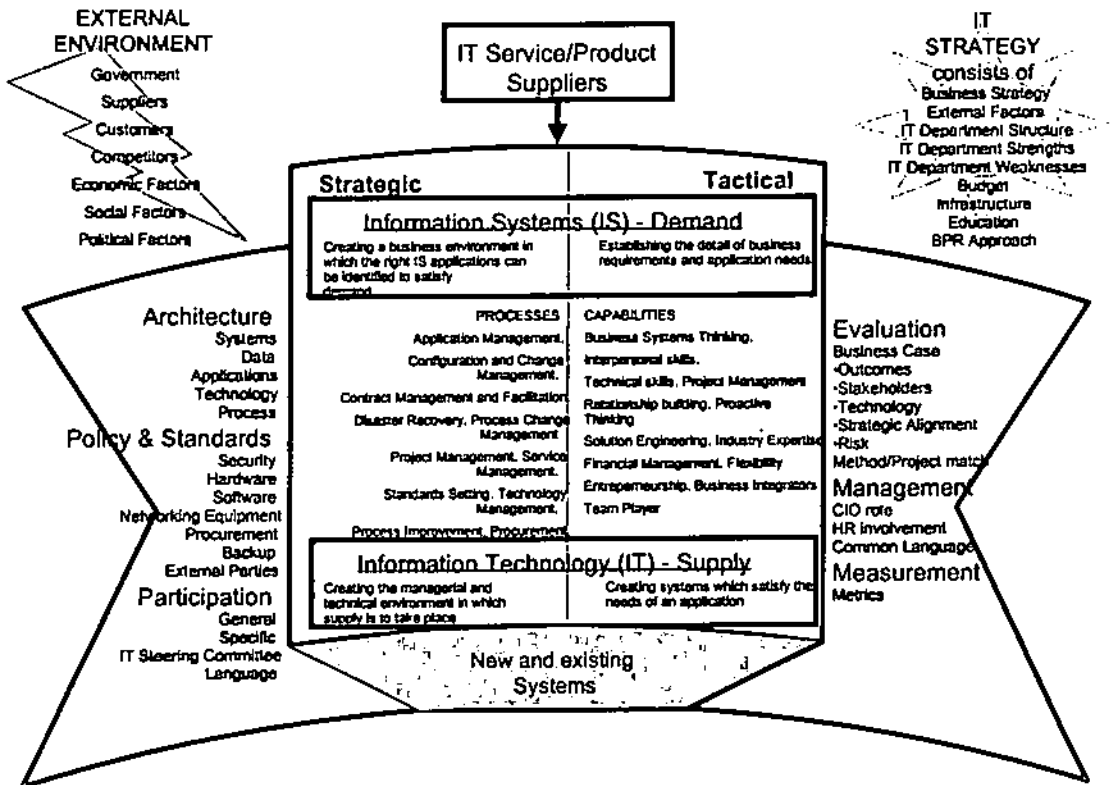


Figure 20 Detailed IT Value Framework

Source: Based on Edwards, Ward, Bytheway (1995:3)

## CHAPTER 8

### CONCLUSION

#### **8.1 Introduction**

This chapter concludes the research report by commenting on the achievement of the research objectives, indicating future research based on the findings of this research as well as concluding remarks on ensuring IT Business Value in South African Organisations.

#### **8.2 Achievement of Research Objectives**

##### **8.2.1 Objective 1**

Derive a framework that can be used by South African organisations to ensure IT Business Value delivery.

A framework was derived based on the findings from the various interviews as well as the findings from the literature survey. This framework can act as a starting point for organisations to use in ensuring that the contribution of IT is improved upon. It can also form part of a benchmark to determine where organisations are and what they still need to do.

### 8.2.2 Objective 2

Understanding the factors that need to be considered for ensuring IT Business Value in South African Organisations.

These were identified from the literature survey and validated in the questionnaires from the IT service providers and case study.

### 8.2.3 Objective 3

Determine the current focus on what technologies are being implemented in South African Organisations at present.

The current focus on technologies been adopted by South African organisations was obtained. This was seen to reflect the trend of international organisations.

### 8.2.4 Objective 4

Understand the major risks that organisations face in the quest for ensuring IT Business Value.

Major risks were identified from literature and questionnaire responses from the IT service provider and Case study. These formed part of the

framework developed.

### **8.3 Future Research**

Possible suggestions for future research are presented next.

- Validate and update the framework with a wider audience, namely, CIO's of numerous South African organisations.
  
- Use the framework to perform an audit on a leading South African IT organisation in a case study format to validate the framework.
  
- Take a part of the framework and do a more in depth study of that particular part i.e. the Business Case process.

### **8.4 Final remarks**

The research provided a wonderful opportunity to do a complete study of factors affecting IT contribution in South African organisations by interviewing senior IT executives in IT service provider firms and CIO single case fieldwork.

The findings indicated that there are some serious risks regarding the resource pool within the IT community. The gap between supply and

demand is widening and many IT skilled people are leaving the country. The answer goes beyond organisational boundaries through to political and economical issues. This once again illustrates that IT cannot be viewed in isolation.

The evaluation of IT needs to be performed in an unambiguous manner so that all stakeholders and the business understand what they are getting, and work together in achieving this. Business and IT strategy are not held in the same regard. Although there are signs that organisations are starting to address this issue.

The bottom line is that organisations need to work as one; IT needs to be part of the strategic planning process. Innovation needs to be kindled, and within the context of the business strategy allowed to develop. The support of top management is crucial. Without this, the effective contribution of IT cannot take place.

We are, or have entered the virtual world, where time and distance have no boundaries. People from all around the world can log on to a server and purchase a product. Organisations need to make sure that their IT departments are ready and skilled, that their functional managers understand the implications, as they could be on call 24 hours a day.

CEO's need to have the belief that their IT departments can contribute effectively to achieving breakthrough results.

## CHAPTER 9

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## CHAPTER 10

### APPENDICES

#### *Appendix A: Confirmation Letter*

2000-08-08

Dear Respondent

#### **SURVEY ON THE FACTORS INFLUENCING IT BUSINESS VALUE**

**Mr R Redaelli** (student number 644-208-0) is registered as a final year student on the Master of Business Leadership degree programme with the Unisa Graduate School of Business Leadership.

Your help is requested in obtaining data for a research project conducted by Mr Redaelli for a dissertation by means of the enclosed questionnaire.

**The due date for the return of the questionnaire is 15 August 2000.**

Mr Redaelli may be contacted at 0833271296.

The research is confidential and the identity of all respondents will remain anonymous. All the results will be aggregated so that the identification of individuals, organisations or locations will not be possible.

Your assistance and co-operation in this matter will be highly appreciated.

Prof René Pellissier

Study Leader

Tel: 0828873481

**Appendix B: Questionnaire**

<b>SECTION A: CURRENT TECHNOLOGY STATUS</b>
---

The following table contains a list of technology solutions. Please rank-order this list based on your current assessment of what organisations are currently implementing. Use 1 to indicate the highest priority and 2 the next most, etc.

Business to Business Solutions (via the internet)

\_\_\_\_\_

Business to Consumer Solutions (via the internet)

\_\_\_\_\_

Call Centres

\_\_\_\_\_

CRM

\_\_\_\_\_

Datawarehousing

\_\_\_\_\_

EIS

\_\_\_\_\_

ERP Solutions (Financials, Sales, Manufacturing)

\_\_\_\_\_

WAP technology

\_\_\_\_\_

<b>SECTION B: IT DEPARTMENTS</b>
----------------------------------

1. Each of the following capabilities have been shown, according to the literature, to be important capabilities that personnel of an internal IT department should have. Using your own experience, for each factor please tell us whether you believe the factor to be 'very important', 'somewhat important', or 'not at all important.' *Indicate your choice by inserting an X in the appropriate box (only one entry per line).*

<b>Capabilities required by IT staff</b>	<b>Not at all Important</b>	<b>Somewhat Important</b>	<b>Very Important</b>
1.1. Business Systems Thinking			
1.2. Interpersonal Skills			
1.3. Technical Skills			
1.4. Project Management			
1.5. Relationship Building (With IT Users)			

2. If you believe that there are additional capabilities, then please provide these in the space below.

3. In your opinion are there any factors that may impede an organisation from having an IT department with all these capabilities. Provide your reasons in the space below.

4. Each of the following processes, according to the literature, can ensure successful IT contribution in an organisation. Using your own experience, for each factor please tell us whether you believe the factor to be 'strongly influential', 'somewhat influential', or 'not at all influential.' *Indicate your choice by inserting an X in the appropriate box (only one entry per line).*

Processes required within an IT department to ensure successful IT contribution	Not at all Influential	Somewhat Influential	Strongly Influential
4.1. Application Management			
4.2. Configuration And Change			

Processes required within an IT department to ensure successful IT contribution	Not at all Influential	Somewhat Influential	Strongly Influential
Management			
4.3. Contract Management and Facilitation			
4.4. Disaster Recovery			
4.5. Process Change Management			
4.6. Project Management			
4.7. Service Management			
4.8. Standards Setting			
4.9. Technology Management (management of hardware, operating systems software, and telecommunications)			

5. If you believe that there are processes not mentioned in the list above, please provide these in the space provided below.

6. Each of the following questions may affect the delivery of IT Value within an organisation. *Indicate your choice by inserting an X in the appropriate box (only one entry per line).*

<b>Organisational Issues</b>			
1.1. Should the CIO (or similar) report to the ...	<b>CEO</b>	<b>CFO</b>	<b>Other</b>
<i>Additional Comments:</i>			
1.2. Should the IT department be...	<b>Centralised</b>	<b>Decentralised</b>	<b>Depends</b>
<i>Additional Comments:</i>			
1.3. Do you believe that Internal IT departments have the ability to deliver IT value...	<b>Not at all</b>	<b>Somewhat</b>	<b>Strongly Agree</b>
<i>Additional Comments:</i>			
1.4. Do users typically view IT departments as adding value?	<b>Not at all</b>	<b>Somewhat</b>	<b>Strongly Agree</b>

<i>Additional Comments:</i>			
1.5.	Do users understand the technical staff?	<b>Not at all</b>	<b>Somewhat</b>
		<b>Strongly Agree</b>	
<i>Additional Comments:</i>			
1.6.	Do you believe that IT staff should be rotated through functional departments?	<b>Not at all</b>	<b>Somewhat</b>
		<b>Strongly Agree</b>	
<i>Additional Comments:</i>			

**SECTION C: IT AND BUSINESS ALIGNMENT**

1. The following is a suggested, high level, approach for aligning business and IT. Using your own experience from organisations, indicate in the space provided whether you believe that 'most', 'some ', or 'none', perform

these high level steps. *Indicate your choice by inserting an X in the appropriate box (only one entry per line).*

High Level Business Alignment Steps	None	Some	Most
1.1. Organisations identify breakthrough objectives that would achieve competitive advantage for the customer			
1.2. Process and Information models are drawn to ensure consensus, communication and identifying enabling technology			
1.3. Standards are defined that do not limit but improve technology exchangeability and are likely future trends			
1.4. Solution mapping is performed by matching process and information models with new or existing technology solutions			

2. The following is a list of general questions. *Indicate your choice by inserting an X in the appropriate box (only one entry per line).*

General Questions	No	Some	Most
2.1. Do most organisations have a Technology strategy?			
2.2. Is this strategy communicated to the Board?			
2.3. Is this strategy communicated to all relevant stakeholders?			
2.4. Is this strategy communicated to the entire organisation?			
2.5. Is the Technology Strategy reviewed often			
Indicate how many times per year			
2.6. Are the business and technology strategies held in the same regard?			
2.7. Are most IT implementations preceded by some form of process reengineering exercise?			

3. If you have further comments regarding IT and Business alignment please use the space provided for below.

--

<b>SECTION D: EVALUATION TOOLS AND TECHNIQUES</b>
---

1. Each of the tools and techniques mentioned below can be used to evaluate IT investments. The first column asks if organisations have used this tool or technique, while, the second column asks if the implementation proceeded according to the output of the tool or technique. As an example, if the system implemented promised a Return on Investment of 10% was this achieved? *By placing an X in the 'Have Used' Box you indicate that the tool or technique was used. By placing an X in the second box, 'Desired Result Obtained' you indicate that the desired result from the tool or technique used was obtained. No entry in the first box automatically implies that the second box cannot be completed.*

EVALUATION OF TOOLS AND TECHNIQUES	Have Used	Desired Result Obtained
1.1. Business Case		
1.2. Critical Success Factors		
1.3. Game-Playing and role playing		

EVALUATION OF TOOLS AND TECHNIQUES	Have Used	Desired Result Obtained
1.4. Information Economics		
1.5. Internal Rate of Return (IRR)		
1.6. Multi-Objective, Multi-Criteria (MOMC) Method		
1.7. Net Present Value (NPV)		
1.8. Payback period		
1.9. Profitability Index		
1.10. Prototyping		
1.11. Rate of Return or Return on Investment (ROI)		
1.12. Some form of Customer/User Involvement		
1.13. Value Analysis		

2. If you believe that there are other tools or techniques not mentioned above please list them in the space provided below.

### **Appendix C: CIO Details**

**Name:** Andre Booyzen

**Brief Summary:** Andre has 15 years of experience in the IT industry. His career followed the traditional model of growth typical of IT companies i.e. programmer, business analyst through to management. The various titles held include, IT consultant, Technology Manager, IT Services Manager and General Manager IT. Industries he has worked in include Hotel and Construction Industry, Finances/HR (Payroll) and Telecommunications.

**Current history and relevant work experience:** Currently employed as General Manager IT at TDS (Telkom Directory Services (Pty) Ltd).

*'Telkom Directory Services (Pty) Ltd is a subsidiary company of Telkom SA, that was formed on the 1st October 1997. This company was a result of a merger agreement between Telkom SA Ltd and Maister Directories. By combining the directory expertise of these two companies, TDS (Pty) Ltd is set to be a world class organisation supplying quality information to both advertisers and consumers in the country.*

*TDS provides a complete Yellow Pages and Phone Book printed directory service as well as an electronic directory service, 10-11-8 "The Talking Yellow Pages" to both businesses and consumers in South Africa.*

*Immediate opportunities are being explored in the areas of expanded directory distribution, enhanced products such as knock-out colour, multiple languages and coupons. While information seeking readers refer to the printed Yellow Pages directories almost 180 million times a year, the rapidly expanding accessibility to interactive technology has presented TDS with a wide range of opportunities. In order to maintain its market leading position of providing fast access to comprehensive information, TDS is busy laying the foundations to meet the challenges of the future by investing in new interactive media services and technologies. Once complete, whether you prefer to let your fingers do the walking or you're cruising down the information superhighway, TDS will offer the biggest list of suppliers of products and services in South Africa.*

*The company has a combined experienced work force of more than 700 people in multiple locations. The three major markets are Johannesburg, Cape Town, and Durban. Additional offices are sited in Pretoria, Bloemfontein, Port Elizabeth, and East London. These offices support a total of twenty Yellow Pages and Phone Book directories'. Teldir (2000).*

Andre's main responsibility involves the setting and implementing of the strategic use of IT at TDS. He currently has a staff complement of 30 people, as well as an additional 30 people reporting indirectly via current projects being implemented. Operational issues have been delegated to various operations management. The company is on a major revamp of their IT systems.

**Appendix D: Raw Data from CIO Case Fieldwork**

The following appendix highlights in point form the more important points raised during the interviews. The questionnaire responses have been added to the data from the IT service providers (indicated separately) in Appendix H:

**CIO Role Comments:**

- A CIO must definitely have '*people skills*'. This in my opinion is the most important. Technical skills of a CIO are not that important. A general understanding is adequate.
- A CIO must have the ability to raise up other leaders in his department.
- Must drive the education process of IT understanding to the users of IT.

**IT Department Comments:**

- Technical staff must not be forced into a management role to earn more money. Personnel must be rewarded for the value they are adding. Some technical personnel cannot make the shift to management.
- I strongly believe that IT departments can add value. They are the closest to the business.
- Certain non-core functions can definitely be outsourced. Network management and desktop repairs are clear examples that need not be the concern of the IT department. Better service levels can be negotiated with providers at reasonable rates.

- Tough job. Lots of stress (new technology appears rapidly, low salaries etc).
- Do not have the time to research trends and topics, especially in organisations where no support from top management.

#### **Vendors and IT Service Providers:**

- Third party relationships need to be developed.
- Important to identify strategic partners (especially global players) and use them for strategic planning and special projects. When required they are pulled in.
- Service providers have the latest knowledge at their fingertips. Most corporate organisations do not have this capacity. Possibly due to the fact that they spend most of their time being sucked into operational issues. No focus is thus spent on strategic issues and technology and trend scanning.
- Manufacturers of certain technologies force organisations in the direction they want them to be. They do not listen to the needs to organisations and supply according to those needs.

#### **Role of Top Management:**

- Management needs to have the right attitude. Managers need either to be replaced or be part of a change management process. Change managers have been employed (at TDS, see Appendix E) to introduce change and to educate managers on the role of IT and to also find out about their fears.

- Provide a budget, which is sufficient to meet the needs of the organisations, and not to expect the CIO to deliver with insufficient funding.

**Users of IT:**

- There is a lot of fear when process-reengineering initiatives take place or new technology is introduced. Jobs are at stake. Change management techniques need to help out with this. The Human Resources department is crucial in this role.
- Top management needs to be open and honest. Communication regarding the consequences of reengineering needs to be communicated early on in the process by HR. Re-skilling and especially retrenchments need to be performed with care.

**Appendix E: Top Companies 2000 IT Sector**

Ranked by market cap:	Market cap (Rm)	Turnover (Rm)	Pre-tax profit (Rm)	Net profit (Rm)	EPS (c)	EPS % change	ROA (%)	ROE (%)	Financial year end	
1	Didata	56 454,1	6 697,1	1 018,5	519,6	82	58	13,8	30,4	Sep 99
1		18 824,8	4 711,5	576,8	282,1	52	53,4	14,6	37,4	9/98
2	Datatec	13 798,2	6 640,8	372,9	213,3	267	207	5,8	20,1	Mar 99
3		9 127,1	1 373,6	93,2	44,4	87	91,1	9,9	54,8	3/98
3	Xchange	4 030,3	281,0	47,7	38,7	27	150,9	18,7	374,5	Jun 99
6		2 077,4	40,0	8,6	8,4	11	-	13,6	-	6/98
4	Comparex	3 857,9	7 681,3	618,0	552,0	158	49,5	9,8	18	May 99
2		16 027,8	4 251,9	2 684,5	992,0	105	63,2	54,9	90,1	5/98
5	Softline	3 023,8	592,2	132,3	80,4	24	88	22,9	37,2	Mar 99
4		3 044,9	460,7	53,4	36,2	13	-71,3	16,8	43	3/98
6	MBTech	1 918,7	1 112,9	45,6	31,9	9	-36	10,7	33,6	Aug 99
12		816,8	1 105,5	17,3	10,4	14	-	15,6	-	8/98
7	Asta	1 900,2	841,1	225,8	219,3	21	-	69,9	111	Jun 99
8	Idion	1 526,5	21,3	8,2	5,2	9	-	23,8	33,6	Feb 99
1		313,0								
9	Prism	1 435,0								
10	MGX	1 272,3	363,6	-112,3	43,9	105	59,2	-21,8	-57,4	Jun 99

Ranked by market cap:	Market cap (Rm)	Turnover (Rm)	Pre-tax profit (Rm)	Net profit (Rm)	EPS (c)	EPS % change	ROA (%)	ROE (%)	Financial year end	
7		1 658,9	193,3	37,9	24,1	66	84,8	13,4	19,5	6/98
11	CCH	1 051,4	470,4	145,9	105,7	140	436,5	24	45,7	Jun 99
5		2 738,2	110,1	28,1	17,1	26	-	11,7	19,5	6/98
12	Fintech	763,5	1 389,4	143,0	88,2	81,7	20,2	12,6	23,9	Feb 99
13		810,1	1 211,7	128,0	85,7	68	20,5	14,7	26,3	2/98
13	OAI	714,0	-	-	-	-	-	-	-	-
14	UCS	640,8	107,3	50,8	36,0	13	113,1	28,3	38,9	Sep 99
15		603,7	45,4	17,1	11,9	6	-	13,9	17	9/98
15	Paracon	524,6	-	-	-	-	-	-	-	-
16	Mustek	501,0	1 284,7	108,9	79,1	86	40,7	17,7	25,5	Jun 99
10		1 055,7	1 101,1	110,4	72,8	61	34,4	23,3	40,4	6/98
17	Siltek	423,6	2 646,9	69,4	41,5	83	-33	6,7	14,7	Jun 99
20		404,6	1 936,2	138,5	60,9	124	-38,7	16,1	30,3	6/98
18	Spescom	380,0	498,3	47,4	41,1	80	78,3	13,3	18,2	Sep 99
11		831,1	346,1	36,5	31,5	64	42,4	14,4	23,8	9/98
19	Faritec	338,1	233,3	26,3	20,4	16	-	22,2	71,2	Jun 99
14		688,5	-	-	-	-	-	-	-	-
20	DCentrix	325,3	168,2	19,1	12,9	9	-	14,3	29,1	Feb 99
21		378,4	-	-	-	-	-	-	-	-

Ranked by market cap:	Market cap (Rm)	Turnover (Rm)	Pre-tax profit (Rm)	Net profit (Rm)	EPS (c)	EPS % change	ROA (%)	ROE (%)	Financial year end	
21	Glotec	298,1	229,2	53,1	12,4	8	-	51,8	102,3	Jun 99
23		258,9	-	-	-	-	-	-	-	-
22	Vesta	211,5	24,5	10,7	7,7	10	-	29,4	52,3	Aug 99
32		96,0	-	-	-	-	-	-	-	-
23	Unihold	209,3	740,5	23,4	29,7	34	19,7	5	11,7	Jun 99
9		234,4	500,3	26,5	19,1	29	30	8,7	12,5	6/98
24	KTL	199,6	-	31,8	31,8	82	-58,7	12,2	11,6	Jun 99
26		183,5	-	68,9	68,9	197	131,1	29,2	28,2	6/98
25	Usko	183,7	680,9	64,5	38,4	10	35,1	14,7	-	Sep 98
9		1 187,2	680,9	64,5	38,4	10	35,1	14,7	-	9/98
26	CS Holding	151,9	75,4	10,2	10,0	9	-	16,4	46,2	Jun 99
3		172,6	-	-	-	-	-	-	-	-

Table 7 Financial Mail Top Companies 200 IT sector

**Appendix F: Management Consultants**

<b>Management Consultant Firms</b>
Andersen Consulting
Arthur Anderson
Computer Sciences Corporation
Deloitte Consulting/DTT
Ernst & Young International
KPMG
McKinsey & Company
PriceWaterhouse Coopers

**Table 8 South African Management Consulting Firms**

**Appendix G: IT Capabilities and Processes Defined**

<b><u>No.</u></b>	<b><u>Capability</u></b>	<b><u>Ability To</u></b>
1.	Business Systems Thinking	The ability to understand business requirements and interrelationships, and then use the appropriate technology to support the business requirement.
2.	Interpersonal Skills	Interpersonal skills include the following: listening actively, providing effective feedback, providing support, trusting, constructive confrontation and mutual influence.
3.	Technical Skills	Ability to understand technology and to solve functional problems, in this case problems in an IT environment.
4.	Project Management	The ability to plan, organise, execute and control projects. Motivate and direct team members through difficult situations.
5.	Relationship Building	The ability to help develop relationships between themselves and their 'customers' based on mutual respect.
6.	Proactive Thinking	The ability to identify problems before they occur, taking the initiative.

<u>No.</u>	<u>Capability</u>	<u>Ability To</u>
7.	Solution Engineering	The ability to provide long lasting, architecturally sound and practical solutions to business problems. Taking all stakeholders into account.
8.	Industry Expertise	The ability to understand the trends of the particular industry and understand what makes it tick.
9.	Financial Management	The ability to manage the finances of a department by controlling costs, preparing effective budgets, investment evaluation and understanding the capital planning process.
10.	Flexibility	The ability to look at all points of view and not be set in ones ways.
11.	Entreperneurship	The ability to search for and identify opportunities in the organisation, and initiate projects to bring about the appropriate change.
12.	Team Player	The ability to communicate, encourage others, resolve conflict and work together.

**Table 9 IT Department Capabilities Define**

<u>No.</u>	<u>Process</u>	<u>Definition</u>
1.	Application Management	Identifying, specifying and quantifying the needs, benefits, resources and costs of any application so as to enable management to make informed evaluation decisions. Ensure that the applications meet the business needs. Any business change is clearly understood then implemented and deployed successfully. (Edwards, Ward & Bytheway, 1995:191)
2.	Configuration And Change Management	The process of defining and maintaining configurations and versions of various artefacts (i.e. systems). This includes baselining, version control, release control, status control and storage control.
3.	Contract Management and Facilitation	The process of negotiating, benchmarking, standardisation, enforcing agreements and implemented according to specified levels.
4.	Disaster Recovery	Process of planing for recovery by anticipating disasters, including total plan for business recovery.

<u>No.</u>	<u>Process</u>	<u>Definition</u>
5.	Process Change Management	The process of understanding the consequence that change has on people, implementing the appropriate change model and listening and reacting to the mood of the organisation.
6.	Project Management	Processes that enable priority setting, meeting deliverables and delivering on time.
7.	Service Management	Monitoring performance to agreed service levels. Manage appropriate resources to resolve issues. Plan the development of services and associated resources to intercept changing user demand. Ensure that the technology is acquired and tested to minimise the risk of application failure. Translating needs into technical and resource implications and developing overall skills and methods accordingly. (Edwards, Ward & Bytheway, 1995:192)
8.	Standards Setting	The process of setting standards to facilitate predictability and smoother management. Also includes the balancing of 'how many' and 'how deep'.

<b>No.</b>	<b><u>Process</u></b>	<b><u>Definition</u></b>
9.	Technology Management	Understanding technology developments, formulating options, and informing others of the implications. Assessing the capabilities of technologies against known needs. Planning and managing the introduction of new technologies to minimise the risk to existing and future business applications. (Edwards, Ward & Bytheway, 1995:192). Management of operations.
10.	Process Improvement	The process of monitoring all processes, identifying improvements, testing them and implementing the changes.
11.	Procurement	The process of cultivating supplier relationships, understanding the implication of value, price and quality, adapting the relationship over time to suit the changing requirements and developing partnerships.

**Table 10 IT Department Processes Defined**

### Appendix H: Raw Respondent Data

This appendix contains the 'exact raw data' obtained from various respondents polled during this research. The interview results (same questionnaire) obtained from the CIO interview are also included and indicated.

#### Section B Findings - Current Technology Status

The current technology status responses were as follows. (**Note:** The interview results (same questionnaire) obtained from the CIO interviews are also indicated in '**Bold Italics**')

Technology Type	Ranking														CIO	
Call Centres	2	2	4	2	4	6	6	1	2	4	1	3	6	1	1	<b>3</b>
Business to Business Solutions (via the internet)	3	7	7	1	3	1	1	2	4	2	7	1	2	2	3	<b>4</b>
CRM	1	5	5	3	5	2	2	3	3	1	2	2	3	6	4	<b>1</b>
ERP Solutions (Financials, Sales, Manufacturing)	6	1	1	4	1	7	7	4	3	3	4	4	8	3	7	<b>5</b>
Datawarehousing	4	4	3	5	7	3	3	4	4	6	5	5	5	5	2	<b>6</b>
Business to Consumer Solutions (via the internet)	5	6	6	7	2	5	5	5	1	7	6	6	1	4	5	<b>2</b>
EIS	8	3	2	6	6	4	4	7	4	5	3	7	7	7	6	<b>7</b>
WAP technology	7	8	8	8	8	8	8	6	3	8	8	8	4	8	8	<b>8</b>

#### Section B Findings - IT Departments

▪ Question 1

Each of the following capabilities have been shown, according to the literature, to be important capabilities that personnel of an internal IT department should have. Using your own experience, for each factor please tell us whether you believe the factor to be 'very important', 'somewhat important', or 'not at all important.'

(Note: The interview results (same questionnaire) obtained from the CIO interviews are also indicated in '***Bold Italics (X)***')

	Capabilities required by IT staff	Not at all Important	Some What Important	Very Important
1.1.	Business Systems Thinking	1	3	11 <b><i>X</i></b>
1.2.	Interpersonal Skills		6	9 <b><i>X</i></b>
1.3.	Technical Skills		3 <b><i>X</i></b>	12
1.4.	Project Management		8	7 <b><i>X</i></b>
1.5.	Relationship Building (With IT Users)		6	9 <b><i>X</i></b>

▪ Question 2

If you believe that there are additional capabilities, then please provide these?

- Proactive Thinking
- Solution Engineering
- Industry Expertise
- Selling
- Focus on being cost effective – many internal IT Depts are still runaway cost drains
- Analysis – specifically diagnosis in event of failure
- Incredible agility and speed of action – in order to meet the changing needs of their company
- Some level of financial ability
- Insight and foresight with regard to the changing technologies and their application to business
- Understanding the business value of IT Systems
- A re-skill must take place in the IT industry. A new dimension is appearing although known in the past it now has a complete new meaning, i.e. business integrators – to align applications with business strategy and business designers to align the new technology with applications especially the E-future era

- Innovative thinking (entrepreneurs). Leadership Qualities
- An important capability would be team playing, it is crucial in the IT environment that personnel are able to function optimally in team environment

▪ Question 3

In your opinion are there any factors that may impede an organisation from having an IT department with all these capabilities?

- Most people enter the IT department as a start in their career development and as soon as they become technically competent and astute they tend to move on to other more challenging areas of the IT industry, i.e. consultant, management, development where they can demand higher incomes etc. Thus most IT departments are generally staffed by young inexperienced personnel on the customer face or in the operations environment. that are learning the ropes and there is a continual rotation of staff. This is one factor that impedes an organisation having all these capabilities
- Budgetary constraints, as well as the high turnover of personnel in the IT industry. The source pool is becoming smaller in SA and the gap between skills in supply and demand are widening.

- Yes – lack of understanding of the importance of IT within the organisation. Lack of IT personnel with the necessary technical knowledge. Lack of interpersonal skills.
- Most IT departments lack in the following:
  - Critical mass to deliver the full scope of services.
  - Infrastructure and budget.
  - Sufficient IT skills and training.
  - Understanding of business processors
- The right mix of people should be able to attain all of these capabilities in overall terms.
- The difficulty may be to have all of these skills in single individuals – many IT professionals with strong technical skills often lack the interpersonal touch – and those who combine these traits often gravitate to the supplier world.
- A misunderstanding of IT's role in an organisation;
- IT not performing its role as a business partner;
- Exclusion of IT from the strategic decision making within the organisation.
- Recruitment skills.
- Lack of vision.
- No long term objectives.
- Scarce resources with appropriate skill
- Remuneration & rewarding
- Adequate training
- Attitude of management and IT focus in company.

- Budgets and the legacy that the IT department provided the solutions normally exceeding budgets and deadlines. Within the E-future era it will become a business driven solution rather than an IT driven solution. The realisation that CRM must be in place to give customers maximum needs satisfaction in the B2B and B2C arena could be a major downfall for business. Solutions will no longer only focus on technology.
  - Lack of training. Appointment criteria based on technical capability and not business thinking
  - Shortage of skills locally
  - Organisations that do not encourage innovation
  - Focus on operational issues and NOT creating the future
  - Lack of understanding of business goals within IT
  - Normally the distribution of skill is such that a highly technical person has very little inter-personal skill. So to find combinations of these skill in one person is rare.
- 
- Question 4

Each of the following processes, according to the literature, can ensure successful IT contribution in an organisation. Using your own experience, for each factor please tell us whether you believe the factor to be 'strongly influential', 'somewhat influential', or 'not at all influential.'

(**Note:** The interview results (same questionnaire) obtained from the CIO interviews are also indicated in '***Bold Italics (X)***')

	<b>Processes required within an IT department to ensure successful IT contribution</b>	<b>Not at all Influential</b>	<b>Some what Influential</b>	<b>Strongly Influential</b>
4.1.	Application Management		<b>9</b>	<b>6</b> <b>X</b>
4.2.	Configuration And Change Management		<b>3</b>	<b>12</b> <b>X</b>
4.3.	Contract Management and Facilitation		<b>10</b> <b>X</b>	<b>5</b>
4.4.	Disaster Recovery	<b>1</b>	<b>6</b> <b>X</b>	<b>8</b>
4.5.	Process Change Management	<b>1</b>	<b>5</b>	<b>8</b> <b>X</b>
4.6.	Project Management		<b>2</b>	<b>13</b> <b>X</b>
4.7.	Service Management		<b>6</b>	<b>9</b> <b>X</b>
4.8.	Standards Setting		<b>10</b> <b>X</b>	<b>5</b>
4.9.	Technology Management (management of hardware,		<b>3</b>	<b>12</b>

	(management of hardware, operating systems software, and telecommunications)		X	
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- Question 5

If you believe that there are processes not mentioned in the list above, please provide these.

- Strategic planning – linked to the business’s own planning process
- Relationship Management, Expectation Management and Client Service
- Build correct expectation
- Proper communication procedures
- Business assurance, i.e. make sure that technology support business objectives
- Business Designers
- Business Integrators

Each of the following questions related to the delivery of effective IT in an organisation.

(**Note**: The interview results (same questionnaire) obtained from the CIO interviews are also indicated in '***Bold Italics (X)***')

▪ Question 6.1.1

Should the CIO (or similar) report to the ...	CEO (score =1)	CFO (score =3)	Other (score = 5)
	15 <b>X</b>		

Additional Comments: IT should be independent from any other department. I don't believe that the CFO is the most informed person to direct IT. IT needs to service the business on their requirements in order to achieve their objectives. It would therefore make more business sense for IT to interact directly with the CEO, or at least sit on the board. Either the CEO or the Chief Operations Officer.

▪ Question 6.1.2

Should the IT department be...	Centralised (score =1)	Decentralised (score =3)	Depends (score = 5)
	4 <b>X</b>	2	9

Additional Comments: IT has the challenge of addressing ever-increasing demands, at a rate which most IT departments, neither have the time, budget, or know-how to address. To fully comprehend and cater for these business demands, IT departments would be far better off centralising, so that their combined efforts are done on a more unified basis. Based on the type of organisation and commonality between the Business Units / Products / Services. Will depend on the business. Centralised with skeleton staff and IT management at regions.

▪ Question 6.1.3

Do you believe that Internal IT departments have the ability to deliver IT value...	Not at all (score =1)	Somewhat (score =3)	Strongly Agree (score = 5)
	1	9	5 X

Additional Comments: They should know the systems of the organisation the best and best know how to improve it by using technology. If internal IT departments added no value, they wouldn't be there. However, most internal IT departments lack the

ability to match the IT value required by organisations. Not only IT value – but they must deliver business value or be closed down / out-sourced. They must change the way they were thinking, planning and executing their roles in the past. Within the parameters that are set by the business. They do have the ability but they face big challenges in staff retentions.

- Question 6.1.4

<b>Do users typically view IT departments as adding value?</b>	<b>Not at all (score =1)</b>	<b>Somewhat (score =3)</b>	<b>Strongly Agree (score = 5)</b>
	5	9 X	1

Additional Comments: This is an area that is easily criticised. The answer to improving the relationship and perceived value add to the users is a complex one. Some pointers to consider would be:

- Improve user education through channels which enable valued contribution and training.
- Remove the critic status given to users.
- Improve the interpersonal skills of IT staff. It's a factor of the marketing ability of the CIO and his team, as well as their understanding of the business value of IT. Depends on the companies focus and technology maturity

▪ Question 6.1.5

<b>Do users understand the technical staff?</b>	<b>Not at all (score =1)</b>	<b>Somewhat (score =3)</b>	<b>Strongly Agree (score = 5)</b>
	5  X	10	

Additional Comments: Comments addressed in previous question.

They shouldn't have to! : In the past IT solutions did not focus on applications alignment with the business strategy as the IT department attempted to impress with the technology and were showing their superior technical skills.

▪ Question 6.1.6

<b>Do you believe that IT staff should be rotated through functional departments?</b>	<b>Not at all (score =1)</b>	<b>Somewhat (score =3)</b>	<b>Strongly Agree (score = 5)</b>
	3	7	5  X

Additional Comments: It could be useful for them to see how their systems work in practice. In certain functions, cross-pollination adds value and builds in redundancy. Only under these conditions should there be rotation. Not as a general rule: -yes to the analysts and managers; no to the 'Techies'. It depends on a number of factors – similarity of departments, products etc, as well as level of IT staff. Certainly Relationship Managers should work very close with the business. To help them understand the business strategy.

### Section C Findings - IT and Business Alignment

#### ▪ Question 1

The following is a suggested, high level, approach for aligning business and IT. Using your own experience from organisations, indicate in the space provided whether you believe that 'most', 'some', or 'none', perform these high level steps.

(Note: The interview results (same questionnaire) obtained from the CIO interviews are also indicated in '***Bold Italics (X)***')

	High Level Business Alignment Steps	None	Some	Most
1.1	Organisations identify breakthrough objectives that would achieve	1	11 <b><i>X</i></b>	3

	<b>High Level Business Alignment Steps</b>	<b>None</b>	<b>Some</b>	<b>Most</b>
	competitive advantage for the customer			
1.2.	Process and Information models are drawn to ensure consensus, communication and identifying enabling technology	<b>1</b> <b>X</b>	<b>11</b>	<b>3</b>
1.3.	Standards are defined that do not limit but improve technology exchangeability and are likely future trends	<b>1</b>	<b>11</b> <b>X</b>	<b>3</b>
1.4.	Solution mapping is performed by matching process and information models with new or existing technology solutions	<b>1</b>	<b>11</b> <b>X</b>	<b>3</b>

- Question 2

General questions on the topic of IT and Business alignment.

(**Note:** The interview results (same questionnaire) obtained from the CIO interviews are also indicated in '***Bold Italics (X)***')

	<b>General Questions</b>	<b>No</b>	<b>Some</b>	<b>Most</b>
2.1	Do most organisations have a Technology strategy?	1 X	10	4
2.2	Is this strategy communicated to the Board?	2	8 X	5
2.3	Is this strategy communicated to all relevant stakeholders?	5 X	9	1
2.4	Is this strategy communicated to the entire organisation?	14 X	1	
2.5	Is the Technology Strategy reviewed often	6 X	8	1
2.6	Indicate how many times per year	4,2,1,1,1,1,1,1,2,1,1 (one respondent indicated when necessary)		
2.7	Are the business and technology strategies held in the same regard?	12 X	3	
2.8	Are most IT implementations preceded by some form of process reengineering exercise?	4 X	10	1

- Question 3

If you have further comments regarding IT and business alignment please list these.

- Most organisations do not really have a formal IT strategy. Those that have are communicated to the board.
- Non-IT people do not understand most of the tools and techniques used during these processes.
- In my experience many medium sized companies still relegate IT to reporting into Finance, or if not, as a second rate function without Board status. This especially leads to misalignment between the business and IT.
- The IT strategy cannot be considered as a separate entity from the Business Strategy. In most businesses nowadays the achievement of the business strategy is, at least in part, through the achievement of a directly related IT strategy.
- IT needs to continuously address ways of measuring its performance. ROI criteria should be developed for each project as well as acceptable Customer Satisfaction Indexes. IT departments must promote its successes through proper communications.
- Organisations must align IT and current as well as future applications with the business strategy, as time is of the essence and businesses will not be able to afford long time scales for application development and changes to systems. They will have to focus on a much shorter period to deliver contributions

or the business will falter. The role of IT in the new CRM world must be clearly defined. The gap between business and IT is getting smaller, but the traditional view of IT as a 'burden' is still prevalent. As new companies and markets emerge that are technology dependant, organisations are beginning to structure themselves to include IT in the entire decision making process.

### Section D Findings - Evaluation Tools and Techniques

Each of the tools and techniques mentioned below can be used to evaluate IT investments. The first column asks if organisations have used this tool or technique, while, the second column asks if the implementation proceeded according to the output of the tool or technique. As an example, if the system implemented promised a Return on Investment of 10% was this achieved?

(**Note:** The interview results (same questionnaire) obtained from the CIO interviews are also indicated in '***Bold Italics (X)***')

	<b>Evaluation Of Tools And Techniques</b>	<b>Have Used</b>	<b>Desired Result Obtained</b>
1.1.	Business Case	<b>11</b> <b>X</b>	<b>9</b>
1.2.	Critical Success Factors	<b>13</b>	<b>10</b>

		X	X
1.3.	Game-Playing and role playing	0	0
		X	X
1.4.	Information Economics	3	0
1.5.	Internal Rate of Return (IRR)	7	4
		X	
1.6.	Multi-Objective, Multi-Criteria (MOMC) Method	1	1
1.7.	Net Present Value (NPV)	6	3
		X	
1.8.	Payback period	11	7
		X	X
1.9.	Profitability Index	5	2
1.10.	Prototyping	11	8
		X	
1.11.	Rate of Return or Return on Investment (ROI)	8	4
		X	X
1.12.	Some form of Customer/User Involvement	13	10
		X	X
1.13.	Value Analysis	9	4
		X	X