

## Chapter 2

# The Research Problem

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## The Research Problem

### 1. Introduction

Chapter 1 discussed the turbulent and competitive business environment of today. The chapter showed that advances in IT are, to a large degree, contributing to the turbulence and competitiveness. IT is also proving to be a key business resource for competing and surviving in this business environment. IT has been, and is still permeating virtually every part of modern society with far-reaching and profound consequences. *“It seems we are only at the start of a radical digitization of business activities, which will have a profound effect on virtually every organisation, both in the private and public sectors. Organisations have become increasingly dependent on IT in their search for corporate success and survival.”* Renkema (2000:3). The demand for IT is on the increase and as a result, companies are set to increase their already high investments in IT.

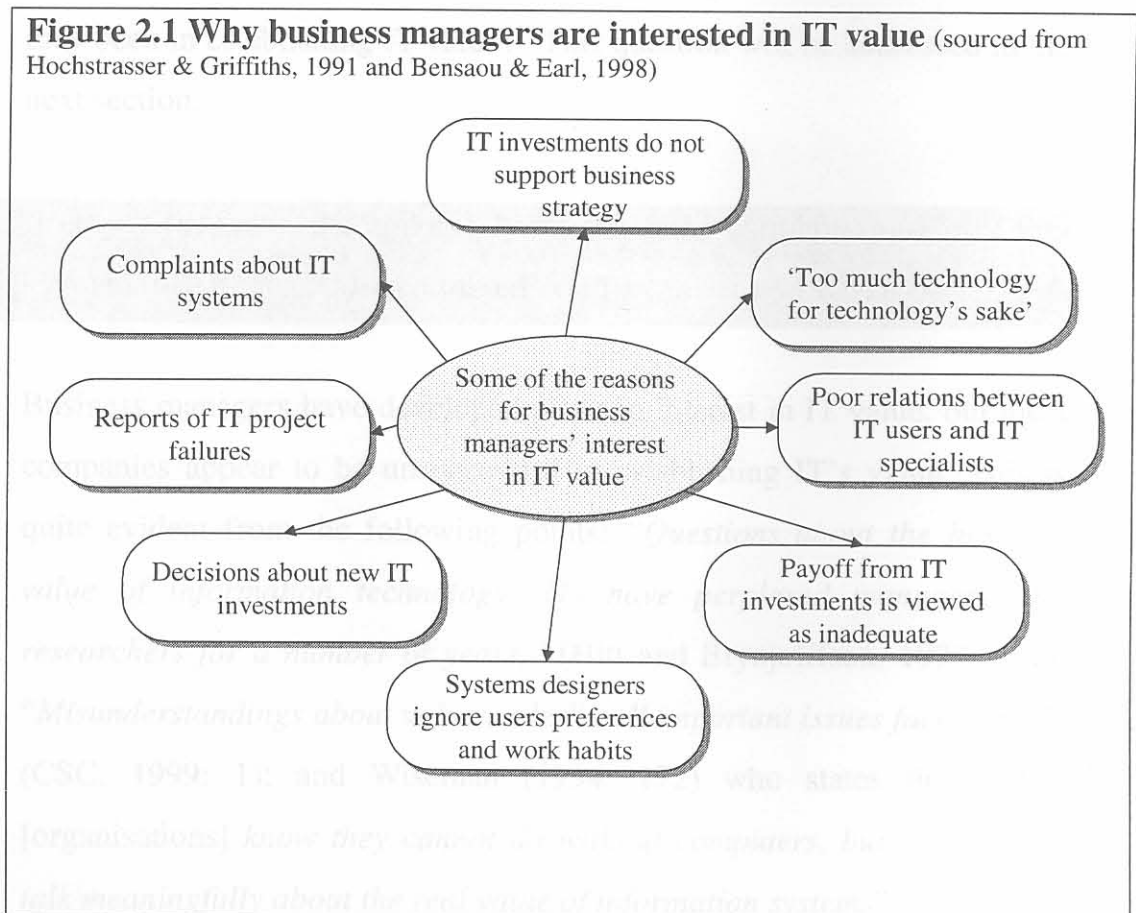
The purpose of Chapter 2 is to present the specific research problem and starts with a literature overview. There are various uses for literature in the Grounded Theory Method: the literature can be used for stimulating theoretical sensitivity; it can also be used as secondary sources of data or it can stimulate questions. The use of literature can direct theoretical sampling or act as supplementary validation (Strauss and Corbin, 1990: 51-52). The overview of literature about IT value has a dual purpose in this research. The first part, presented in Chapter 2, is to explore the phenomenon of dissatisfaction with explanations of IT value. The aim is to stimulate theoretical sensitivity and questions that will, in turn, facilitate the formulation of the research problem. The next part of the literature overview, described in Chapter 3, has the purpose to examine available

research and approaches that are relevant to the research problem. Once the literature overview has been completed, the research question will be posed and discussed in more detail.

## 2. Business managers have developed a strong interest in IT value

Business managers have a strong interest in IT value: *“Nowadays, it is not so much the question of whether to invest, but more the question of how and where to invest in order to get maximum business value and to increase return on investment.”* (Renkema, 2000: 4). There could be various reasons for managers’ interest in IT value as shown in Figure 2.1.

**Figure 2.1 Why business managers are interested in IT value** (sourced from Hochstrasser & Griffiths, 1991 and Bensaou & Earl, 1998)



In addition to the above reasons, Renkema (2000: 8) points out that senior managers are expecting more explicit responses to key questions like:

- How can we evaluate the business benefits of proposed IT investments?
- What is the contribution of our IT investments to improving our corporate strategy and business leverage?
- How can we monitor the progress and performance of investments, in order to identify improvement actions?
- How can we get evidence of adequate returns on the funds invested?

Business managers' interests in IT value have been confirmed and elaborated upon. The question can be asked though: "How successful have they been in establishing IT value?" This question will be addressed in the next section.

### **3. Attempts to prove the linkage between IT investments and business performance have produced mixed results (Jurison, 1996: 264)**

Business managers have developed a strong interest in IT value, but most companies appear to be unsuccessful in establishing IT's value. This is quite evident from the following points: "*Questions about the business value of information technology (IT) have perplexed managers and researchers for a number of years.*" (Hitt and Brynjolffson, 1996: 121); "*Misunderstandings about value underlie all important issues faced by IS*" (CSC, 1999: 1); and Wiseman (1994: 172) who states that "*They [organisations] know they cannot do without computers, but they cannot talk meaningfully about the real value of information systems*".

The troublesome history of demonstrating the return on and value of IT investments (IT investments have repeatedly been the subject of disappointed expectations) as well as the evaluation of IT raise many questions (Renkema, 2000: 7-8). Willcocks (1994: 3-4) state that the success in controlling and measuring IS investments has not been impressive and Axson (1992: 19) adds that achieving tangible benefits in terms of added value remains one of the major management challenges.

Since the evaluation and control of IT investments have become a vital task for management, the inability to effectively assess IT's value is a critical management issue (Willcocks, 1994: 2). The next section shows that the effective evaluation of IT forms part of a very complicated set of problems.

There are, however, further potential problems and complications

#### **4. There appears to be a myriad of obvious and not-so-obvious, interconnected problems that inhibit IT evaluations**

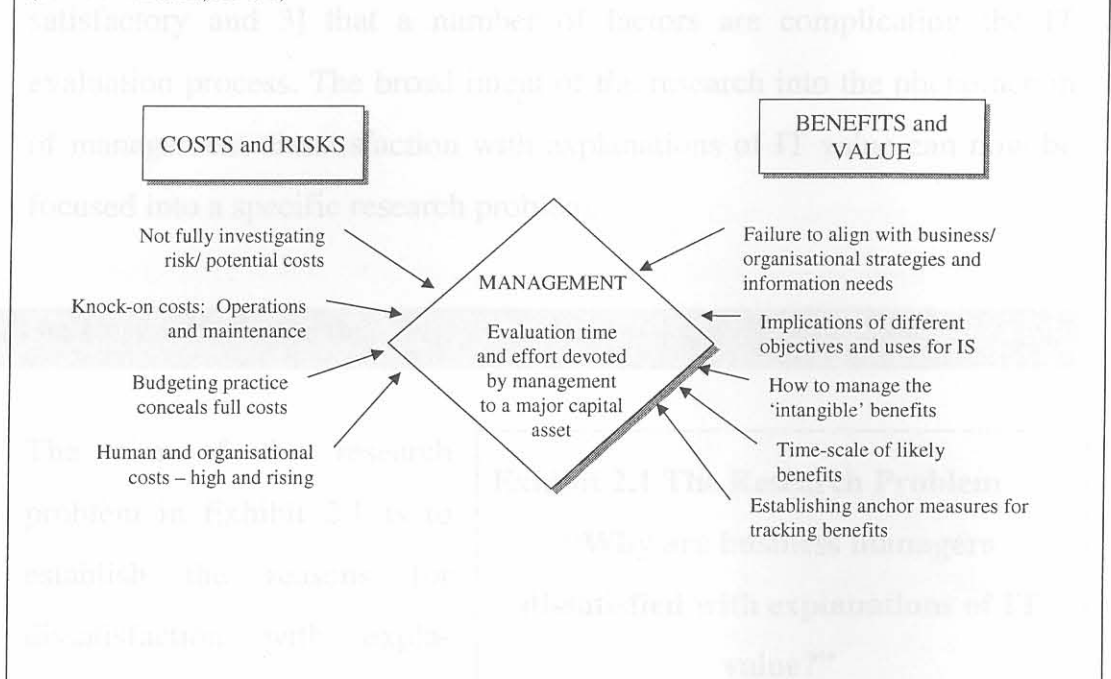
Remenyi *et al* (1995: 23) state that *“The evaluation of IT is at best a difficult process which in certain circumstances may be quite costly and therefore it should be made clear to everyone why this process is being undertaken.”*

Many reasons have already been identified for the inability to effectively evaluate IT investments. In Figure 2.2, Willcocks highlights some emerging problems in evaluating IT. The problems center around three points: IT costs and risks, IT benefits and management's involvement in such evaluations.

The preceding discussions confirmed that 1) business managers have developed a strong interest in IT's value, 2) the IT evaluation process

**Figure 2.2: Emerging problems in the evaluation of the IS contribution**

(Source: Willcocks, 1994: 5)



There are, however, further potential problems and complications. Renkema (2000: 28-33) shows in Table 2.1 why investment evaluations are complex and also why investment evaluations are critical.

<b>Investment evaluation: why critical?</b>	<b>Investment evaluation: why complex?</b>
<ul style="list-style-type: none"> <li>• Preventing the misallocation of financial resources</li> </ul>	<ul style="list-style-type: none"> <li>• Benefits are difficult to assess, measure and manage</li> </ul>
<ul style="list-style-type: none"> <li>• Improving business performance</li> </ul>	<ul style="list-style-type: none"> <li>• Costs are high and difficult to predict</li> </ul>
<ul style="list-style-type: none"> <li>• Creating a shared investment vision and capturing learning opportunities</li> </ul>	<ul style="list-style-type: none"> <li>• Large uncertainties and major risks</li> </ul>
<ul style="list-style-type: none"> <li>• Allowing profitable exploitation of IT-based infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Communication problems and stakeholder politics</li> </ul>

The preceding discussions confirmed that 1] business managers have developed a strong interest in IT's value, 2] that IT evaluations are

producing mixed results, i.e., explanations of IT value are not fully satisfactory and 3] that a number of factors are complicating the IT evaluation process. The broad intent of the research into the phenomenon of management dissatisfaction with explanations of IT value can now be focused into a specific research problem.

## 5. The Research Problem

The aim of the research problem in Exhibit 2.1 is to establish the reasons for dissatisfaction with explanations of IT value. This approach is considered quite

### Exhibit 2.1 The Research Problem

**“Why are business managers  
dissatisfied with explanations of IT  
value?”**

appropriate, because real progress with the issue of dissatisfaction with explanations of IT value will depend on a better understanding of this apparently very complex problem. In order to progress with this issue, we need to appreciate which factors complicate explanations of IT value, how these factors could influence the issue and also how they relate to each other. The remainder of Chapter 2 will further examine the issues that possibly relate to the phenomenon of management’s dissatisfaction with explanations of IT value.

## 6. Dissatisfaction with explanations of IT value forms part of a network of related problems

Certain factors associated with the dissatisfaction with IT value explanations have already been discussed in the previous sections. There

are additional factors pertinent to why managers could be dissatisfied with explanations of IT value.

For instance, determining business managers' role in managing IT vs the role of the IT manager; changes in performance measures (including measures of IT value); the many and often diverse IT evaluation methods and the views business managers have of IT are some of the factors. It would appear that these factors are quite inter-related and seem to form a complex network of related problems.

This network of issues is shown in Figure 2.3 (This figure has primarily been derived from Renkema, 2000; Jurison, 1996; Strassman, 1997; Remenyi *et al*, 1995; Willcocks, 1994; Axson, 1992; and Hochstrasser and Griffiths, 1991).

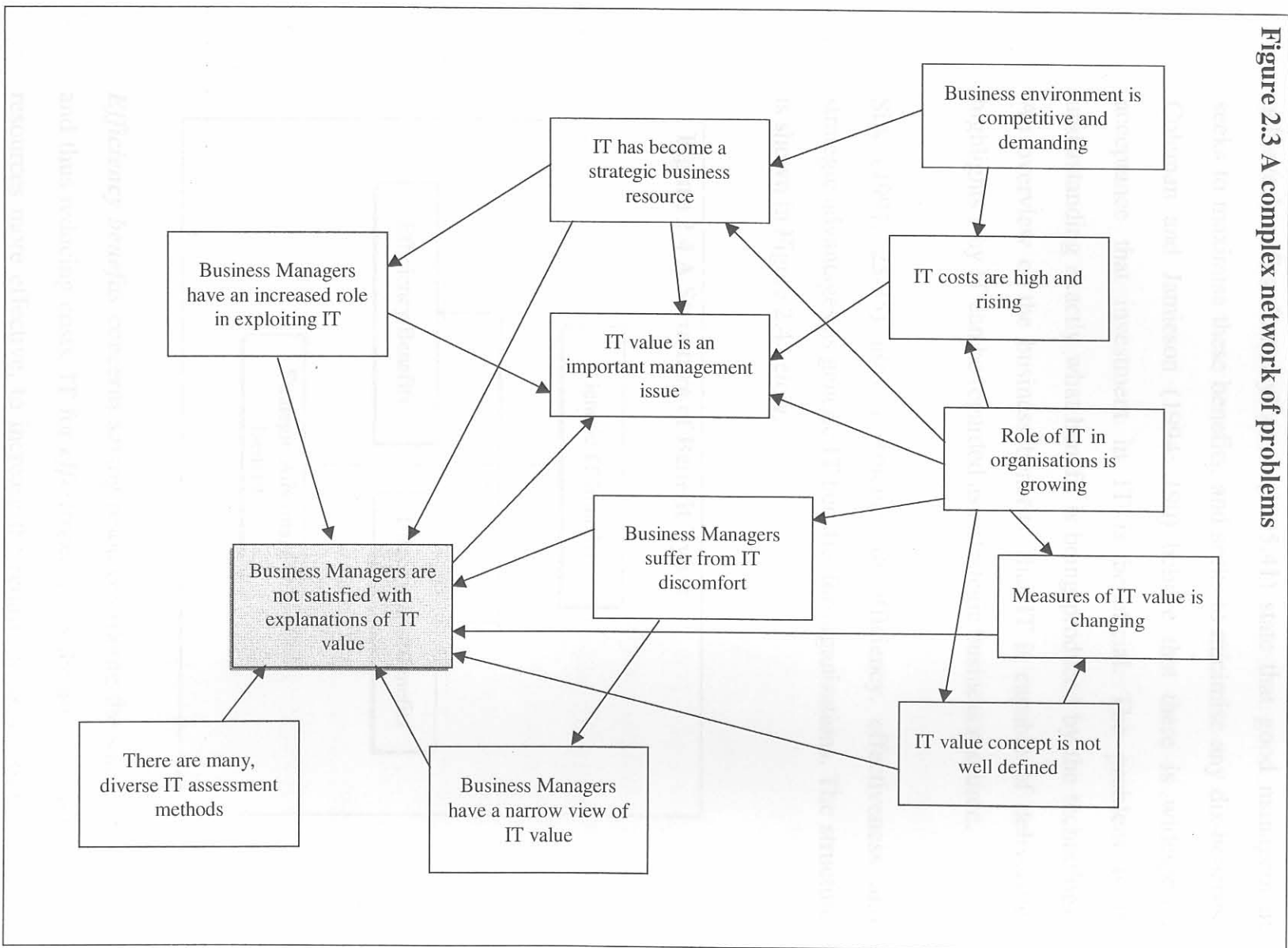
The turbulent and competitive business environment was already discussed in Chapter 1. Each of the other issues will now be discussed in more detail in the following sections.

## 7. IT has become a strategic business resource

Although the strategic importance of IT as business resource was described in Chapter 1, the purpose of this section is to illustrate the spectrum of benefits that makes IT of strategic importance. The wide range of benefits from IT also complicates the evaluation of IT. Remenyi *et al* (1995:40) adopted the following as a definition of an IT benefit: '*An IT benefit is an advantage or good, something produced with the assistance of computers and communications for which a firm would be prepared to pay.*'

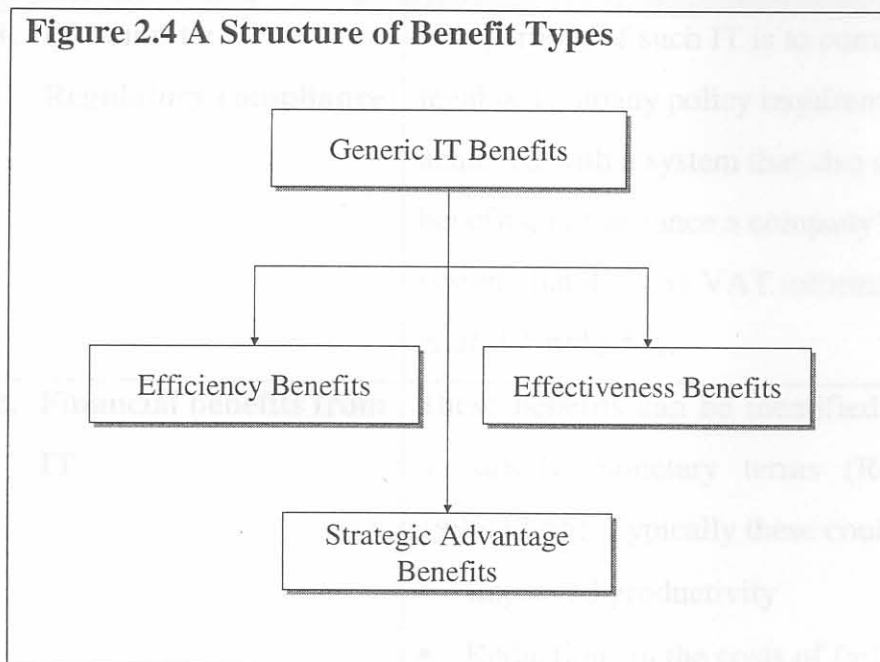


Figure 2.3 A complex network of problems



The implementation of computers systems in an organisation is meant to achieve benefits. Remenyi *et al* (1995:41) state that good management seeks to maximise these benefits, and seeks to minimise any dis-benefits. Coleman and Jamieson (1994: 190) believe that there is widespread acceptance that investment in IT is beneficial. The problem is in understanding exactly what benefit is being produced by the technology. An overview of the business benefits, that IT is capable of delivering, highlights why IT can be regarded as a strategic business resource.

Silk (1991: 25-35) uses a structure of efficiency, effectiveness and strategic advantages as generic IT benefits for organizations. The structure is shown in Figure 2.4 below.



*Efficiency benefits* concerns saving resources (doing the same job better) and thus reducing costs. IT for *effectiveness* has the aim of making other resources more effective, to increase the return on these assets, it is not about immediate cost savings. It also aims to not only do the same job

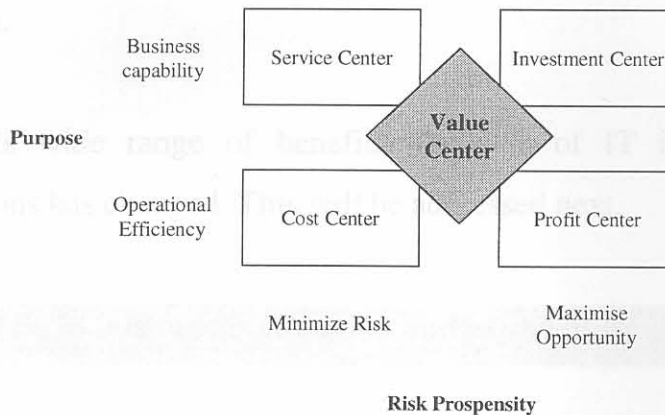
better, but doing a better job overall. This benefit may provide scope for growing or improving the business. The third generic IT benefit is about *improving the business* through using IT to add value to products or to deliver or support products. This type of benefit concerns new ways of doing new business. The resources referred to include people, money, material, energy, time and information.

Remenyi *et al* (1995:42-55) discuss five classes of benefits. Table 2.2 provides a brief description of each of the benefit categories according to Remenyi *et al*:

<b>Benefit Category</b>	<b>Description</b>
<b>1. IT benefits: Regulatory compliance</b>	The purpose of such IT is to comply with some legal or company policy requirement. It may be achieved with a system that also delivers other benefits. For instance a company's accounting system that delivers VAT information (Remenyi <i>et al</i> , 1995:42-55).
<b>2. Financial benefits from IT</b>	These benefits can be identified and measured in strictly monetary terms (Remenyi <i>et al</i> , 1995:42-55). Typically these could be ... <ul style="list-style-type: none"> <li>• Improved productivity</li> <li>• Reductions in the costs of failure</li> <li>• Improved cash flow and reduced bad debts</li> <li>• Reduced computer costs</li> <li>• Reduced overhead costs</li> </ul>

<p><b>3. Quality of service benefits from IT</b></p>	<p>These benefits affect customers directly. A financial value can often be attached to them (Remenyi <i>et al</i>, 1995:42-55). Examples of such benefits are:</p> <ul style="list-style-type: none"> <li>• Improved response times</li> <li>• Improved interface with clients</li> <li>• Improved resource utilisation</li> </ul>
<p><b>4. Internal management benefits from IT</b></p>	<p>These intangible benefits include better decision making or improving management productivity (Remenyi <i>et al</i>, 1995:42-55)</p>
<p><b>5. Benefits from IT infrastructure</b></p>	<p>Because of the enabling nature and shared nature of IT infrastructure, its benefits are more diffuse and difficult to measure than the benefits of more traditional systems. The real value of IT infrastructure comes from its flexibility - the ability to provide options for leveraging future IT applications (Jurison, 1996: 267)</p>

Silk as well as Remenyi *et al* have used categories to depict the many different benefits that IT is capable of producing. Venkatraman's (1997: 52-53) concept of a Value Center shows yet another way of grouping IT benefits. The Value Center concept is shown in Figure 2.5

**Figure 2.5 The Value Center Concept**

From the Value Center concept, four interdependent sources of value from IT resources are recognised.

- The *cost center* has an operational focus that minimizes risks and emphasises operational efficiency.
- The *service center* (while continuing to minimise risk) aims to create IT-enabled business capabilities in support of strategy.
- The *investment center* has a long term focus to create new IT-enabled business capabilities.
- The *profit center* is lastly, designed to deliver IT services to the external market place. The purpose is incremental revenue and to achieve experience in becoming a world-class IT organisation.

This section has shown that IT is capable of a wide range of benefits that ranges from operational to strategic in nature. This not only confirms IT's potential as a strategic resource, but also provides insight into the difficulties in accounting for the wide range of benefits in an IT evaluation.

Due to its wide range of benefits, the role of IT in business and organisations has changed. This will be addressed next.

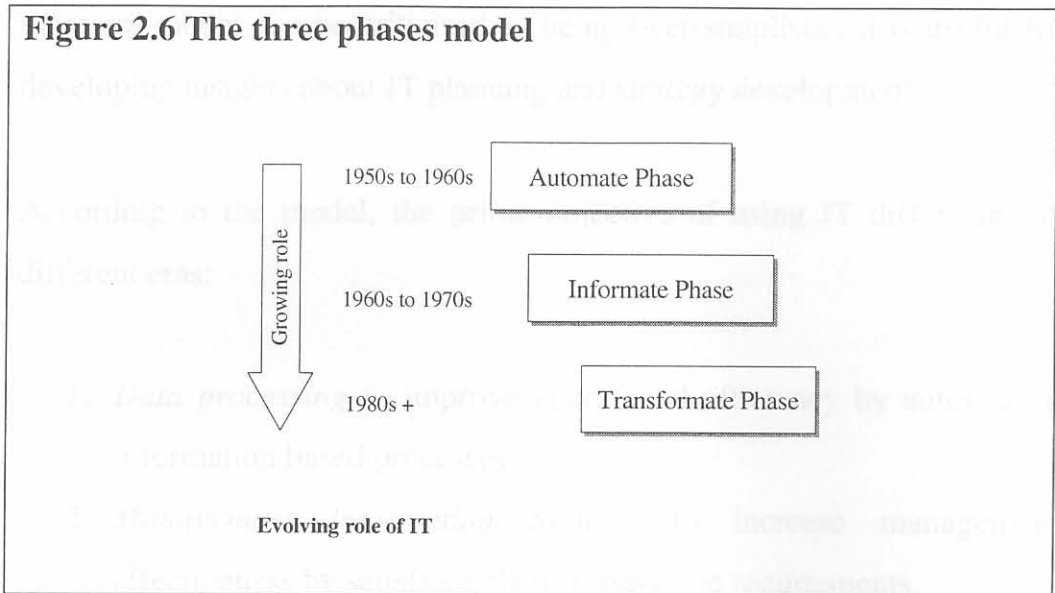
## 8. The role of IT in business is changing and expanding

Many new IT systems are no longer introduced for the purpose of improving operational efficiency, but for creating competitive advantage or strategic opportunities in the future. Various models exist to illustrate the resulting changed role of IT in business and in organisations.

A number of these models will now be reviewed. A popular model is the one showing how the role of IT has evolved through three distinctive phases since the introduction of computers in the 1950s (Remenyi *et al*, 1995: 2-4). The model is depicted in Figure 2.6.

The transformate phase started in the late 1980s. It has developed the awareness that IT can be used in a way to radically change the way an organisation does business. The nature of the organisation can even be changed.

Ward and Gillfain (1996: 10-12) discuss the evolving role of IT. Ward and Gillfain (1996: 10-12)



The **automate phase** spanned the late 1950s and 1960s. The emphasis was on reducing routine and tedious work. The primary benefits were greater speed and accuracy as well as cost reductions in certain areas. Increased profit or cash flow or improved ROI or competitive position was not considered as computer-related issues.

The second or **informate phase** stretched from the 1970s to the 1980s. The aim was to facilitate the improved management and control of the organization. More success was however achieved in improving organizational efficiency than in improving effectiveness.

The **transformate phase** started in the early 1980s. It has developed from the awareness that IT can be used in some cases to radically change the way an organization does business. The nature of the organization can even be changed.

Ward and Griffiths (1996: 10-12) use a three-era model to depict the evolving role of IT. Ward and Griffiths maintain, that while a simple

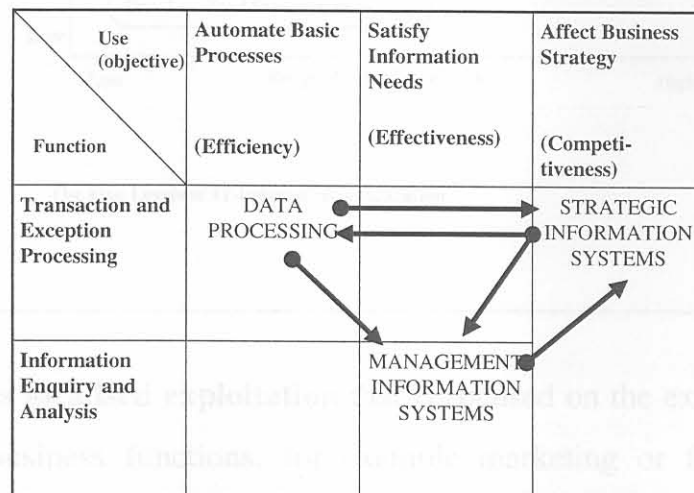
three-era model can be criticised as being over-simplistic, it is useful for developing insights about IT planning and strategy development.

According to the model, the prime objective of using IT differs in the different eras:

1. *Data processing* to improve operational efficiency by automating information based processes.
2. *Management Information Systems* to increase management effectiveness by satisfying their information requirements.
3. *Strategic Information Systems* to improve competitiveness by changing the nature or conduct of business.

The model is shown in Figure 2.7 (sourced from Ward and Griffiths, 1996: 12).

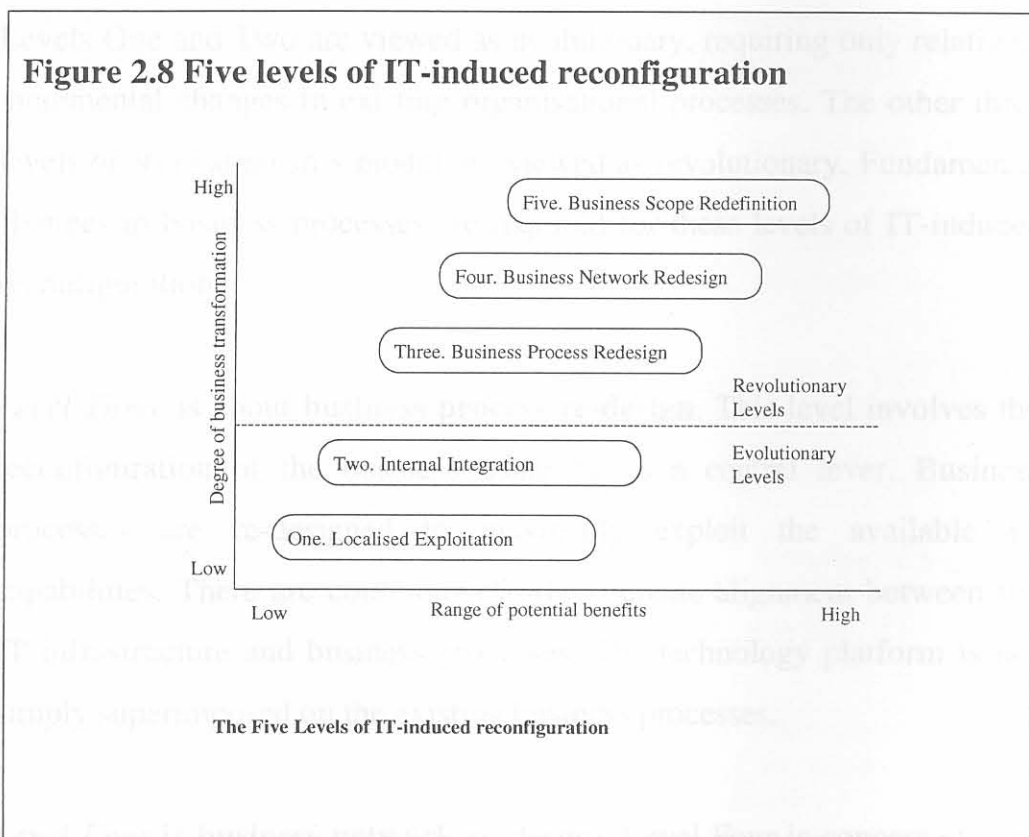
**Figure 2.7 The three era model**





Ward and Griffiths emphasize that the use of 'eras' does not suggest a sequential relationship. Automating basic processes and satisfying information needs are still relevant today.

Venkatraman (1991: 125-150) uses another model to display the changing role of IT. The model is based on five levels of IT-induced reconfiguration and is shown in Figure 2.8. Each of the levels will be discussed in more detail.



*Level One* is **localised exploitation** that is focused on the exploitation of IT within business functions, for example marketing or finance. The objective of deploying IT in this level is to improve the task efficiency of operations. Related areas of operation are not necessarily affected.

*Level Two* is about **internal integration** and is a logical extension of level one. This is achieved through exploiting IT capabilities in all the possible activities within the business process. Firstly technical integration of the different applications and systems using a common IT platform is important. Secondly integrating the roles and responsibilities that exploits the capabilities from the technical integration is important. Both business effectiveness and efficiency are potentially enhanced.

Levels One and Two are viewed as evolutionary, requiring only relatively incremental changes in existing organisational processes. The other three levels of Venkatraman's model are viewed as revolutionary. Fundamental changes in business processes are required for these levels of IT-induced reconfiguration.

*Level Three* is about **business process re-design**. This level involves the reconfiguration of the business using IT as a central lever. Business processes are re-designed to maximally exploit the available IT capabilities. There are conscious efforts to create alignment between the IT infrastructure and business processes. The technology platform is not simply superimposed on the existing business processes.

*Level Four* is **business network re-design**. Level Four is concerned with the reconfiguration of the scope and tasks of the business network involved in the creation and delivery of products and services. This refers to business tasks both within and outside the formal boundaries of a focal organisation. Electronic integration across key partners in the changed business network becomes the dominant strategic management challenge.

**Business scope redefinition** is the fifth and last level. This touches the reason for existence of an organisation. It considers *enlarging* the business mission and scope (through related products and services) as shifting the business scope (through the substitution of traditional capabilities with IT-enabled skills).

The five levels can be summarised as follows (Venkatraman, 1991, 150):

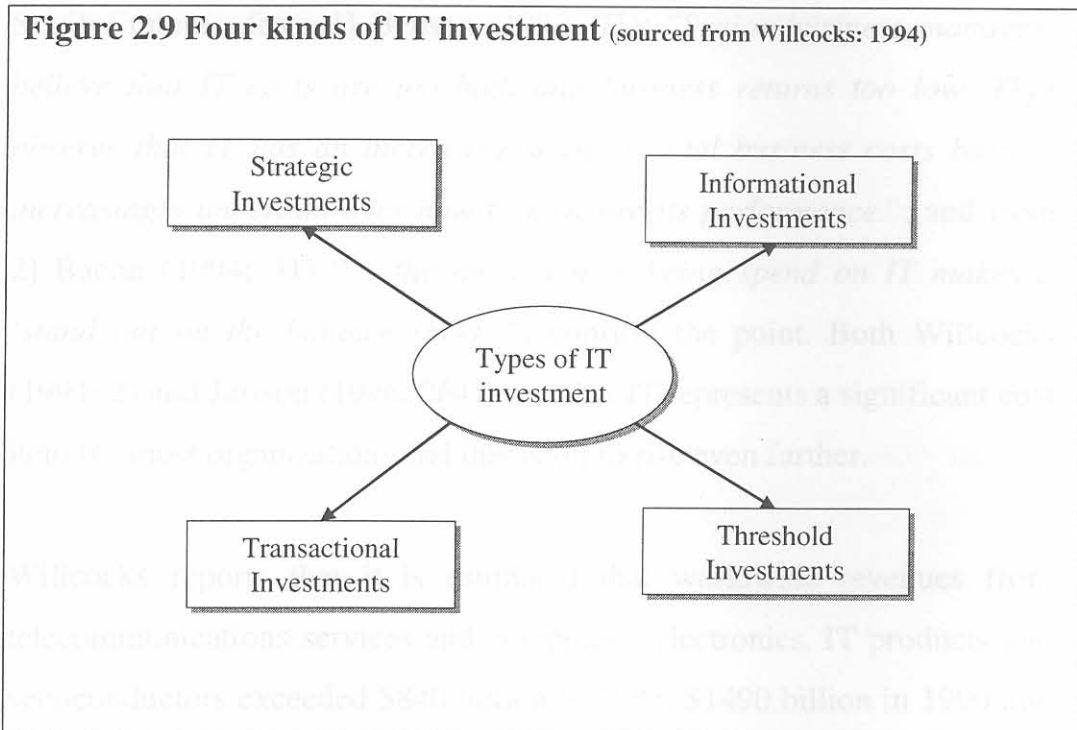
Level	Theme	Potential Impacts	Major Objectives	Management Implications
One	Localised Exploitation	Potentially high savings in narrow areas of business	Reduced costs and/or improved service	Identify firm-specific areas for exploitation
Two	Internal Integration	Integration offers both efficiency and effectiveness	Elevate IT as a strategic resource	Articulate the logic for integration
Three	Business Process Redesign	Powerful in creating differential capabilities in the market place	Re-engineer the business with IT lever	Strategy-IT alignment
Four	Business Network Redesign	Opportunities for creatively exploiting capabilities	Create a virtual organisation and occupy a central position in the network	Articulate the logic of the network redesign for the local firm
Five	Business Scope Redefinition	Altering the business scope both pro-actively and reactively	Identify new business as well as potential threats	Identification of new scope of business

The four kinds of IT investments mentioned by Willcocks (1994: 15-16) demonstrate the present prominent role of IT in business:

- **Strategic investments** have the purpose of longer-term competitive advantage and revenue growth.
- **Informational investments** are associated with medium-term goals of improving management decision-making.

- *Transactional investments* have the aim of reducing the costs of doing business.
- *Threshold investments* may be required in order to compete in a particular industry - they are necessary for the organization's survival.

**Figure 2.9 Four kinds of IT investment** (sourced from Willcocks: 1994)



This section has described how the role of IT has developed from achieving operational efficiencies to the attainment of strategic and competitive advantages. In view of IT's growing role in organisations and their business strategy, it is no surprise that IT investment levels and costs are also on the increase.

## 9. IT investments and costs are high and still increasing

IT costs are a major management concern. Renkema (2000: 10) states that: *"Investments in IT-based infrastructure constitute a major and increasing*

*portion of the capital expenditures of the modern enterprise. These investments not only determine a firm's efficient and effective business operations today, but also to a large extent the ability to improve its future performance. Top management no longer wants to treat the value prospects of proposed investments as articles of blind faith."*

Similar quotes, from 1] Benson (1998: 75): *"Senior business managers believe that IT costs are too high and business returns too low. They observe that IT has an increasing share of total business costs but are increasingly uncertain over how to measure its performance."*; and from 2] Bacon (1994: 31) *"... the amount now being spend on IT makes it 'stand out on the balance sheet' "*, confirm the point. Both Willcocks (1994: 2) and Jurison (1996: 264) state that IT represents a significant cost item for most organizations and this is set to rise even further.

Willcocks reports that it is estimated that worldwide revenues from telecommunications services and equipment, electronics, IT products and semiconductors exceeded \$840 billion in 1985, \$1490 billion in 1990 and are predicted to exceed \$2100 billion in 1995. Some predictions indicate that by the year 2000, the whole IT industry would account for some 10% of world economic activity. There is also a rising trend in IT expenditure (Willcocks, 1994:1-2; Peters, 1994: 99). Renkema (2000: 5) states that IT investment claims a major and increasing part of a firm's financial resources.

The increases in IT investment and cost levels have increased management's interest in the returns and value from IT. This point was already discussed earlier in the chapter.

## 10. Business managers have a growing role in managing IT for value

Traditionally the responsibility for achieving value from IT is regarded as mainly that of the IT department. Business managers have not necessarily seen themselves as being directly responsible for getting value from IT. There is also the implicit assumption in many organisations that IT benefits will accrue automatically (Willcocks, 1994; Remenyi *et al*, 1995, Wang, 1994).

Organizations have realized that IT benefits do not happen automatically. With the emphasis on managing IT for value (i.e., deploying and using it effectively), business managers are assuming a much more direct role in managing the deployment and use of IT, i.e., the process of managing IT for value. The increased business importance of IT is dictating that business managers and not IT managers direct the organization to maximize value from the use of IT (Remenyi *et al*, 1995; Strassman, 1997).

Business managers' interest in IT value was long focused on mainly the decisions about new IT investments. This interest is now shifting to the optimization of benefits from IT assets. It is acknowledged that business managers have a growing role in managing IT for value, in other words ensuring that the targeted IT benefits are realised. Business managers are realising that in the very competitive business world, using IT effectively has become a critical success factor for many organizations (Willcocks, 1994).

Axson (1992) also maintains that business management needs to direct the deployment and use of IT to the best advantage of the organization. King

(1997) notes, in addition that *“Business managers, not technology managers, should take responsibility – and be held accountable – for achieving the financial and strategic goals of IT investments.”*

This has implications for business managers and for IT evaluation. *“Given the large and rising expenditure on IT and its potential critical importance, clearly, the evaluation and control of IT investments becomes a vital management task.”* (Willcocks, 1994: 2). Establishing the value achieved from IT, is for business managers, integral to the process of managing IT for value. Business managers’ interest in new IT investments has expanded. They are now also interested in IT value measurement as an indication of how well or how effective the deployment and use of IT are being managed (Remenyi *et al*, 1995; Jurison, 1996).

## 11. Business managers are not comfortable with IT

One of the complications stemming from managers’ increased role in exploiting IT is that many of them suffer from IT discomfort (Wang, 1994; Silk, 1991). Most executives do not have a clear picture of what IT’s value to the business really is or what it should be (Swift, 1992).

These business managers do not fully understand how to use information technology to create value or to further their business goals (Reimus, 1997). *“One of the most important aspects of selecting a job is to ensure that senior management is willing to commit the dollars required to turn the IT department around. One of the ways I tested this commitment was by examining the senior executives’ personal relationship with technology. If they are unwilling to use computers or to go on-line, or even unwilling to learn about technology, it is very difficult to communicate to them the*

*value of technology.*” (A citation from the Working Council for Chief Information Officers, 1999: 11). Hochstrasser and Griffiths (1991:23) state that, as much as 38% of companies believe that poor understanding of IT potential by senior management is a constraint on optimizing IT.

Business managers’ discomfort with IT manifests in various ways. Axson (1992: 22) mentions the poor decisions by senior management about IT investments. These decisions are made with little realistic appraisal of the true benefits to be realised. Willcocks (1994: 5) and Axson (1992: 23) maintain, in addition, that although IT is becoming more important, top management is not devoting enough time and effort to IT issues. (See also Figure 2.1 above.)

According to McCusker (1992: 25) management is increasingly questioning the value-for-money from IT investments and the business effectiveness of IT. But McCusker then proceeds to pose an important question in this regard: “... *does business management know what they mean when they say they are looking for value-for-money out of IT?*”.

Closely related to management’s discomfort with IT, is the matter of how organisations view IT as a business resource.

## 12. Organisations tend to have a traditional view of IT

Dissatisfaction with IT value explanations could be related to how organisations view IT. In this context ‘view’ is considered to mean: “The manner or mode of looking at things, considering a matter ...” or “to consider, to form a mental impression or judgment of” (Cassell Paperback Dictionary 1998: 1226). ‘View’ is also described by the Oxford Advanced



Learner's Dictionary (1989: 1420) as a "way of understanding or interpreting a subject, series of events, etc."

Traditionally the interest in IT value tends to have a strong financial bias. Organisations and business managers prefer to see IT value expressed in quantified, financial terms. Over-emphasizing these aspects of IT value may cause them to lose sight of other less measurable, but still important IT benefits.

In their discussion of the role of the Corporate Information Officer (CIO) in adding value through IT, Earl and Feeney (1994: 13) refer to the importance of perceptions about IT. Earl and Feeney distinguish between perceptions of IT as a liability and perceptions about IT as an asset. This is elaborated upon in Table 2.3

<b>Issue</b>	<b>IT is a Liability</b>	<b>IT is an Asset</b>
Are we getting value for the money?	ROI is difficult to measure and the organisation is notably unhappy with IT as a whole	ROI is difficult to measure, but the organisation believes IT is making an important contribution
How important is IT?	Stories of strategic use of IT are dismissed as irrelevant to "this" business	Stories of strategic use of IT are seen as interesting and instructive
How do we plan for IT?	IT plans are made by specialists or missionary zealots	IT thinking is subsumed by business thinking

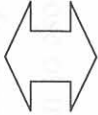
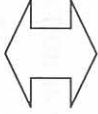
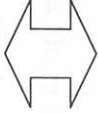
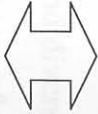
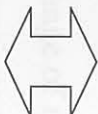
**Table 2.3 Perceptions about IT**

Issue	IT is a Liability	IT is an Asset
Is the IT function doing a good job?	There is general cynicism about the track record of IT	The performance of IT is no longer an agenda item
What is the IT strategy?	Many applications are under development	IT efforts are focused on a few key initiatives
What is the CEO's vision for the role of IT?	The CEO sees a limited role for IT within the business	The CEO sees IT as having a role in the transformation of the business
What do we expect of the CIO?	The CIO is positioned as a specialist functional manager	The CIO is valued as a contributor to business thinking and business operations

In developing a concept called the 'Value Center', (as discussed earlier), Venkatraman describe how organisations could view IT. Venkatraman distinguishes between viewing IT as a commodity and viewing IT as a strategic resource. These views are expanded upon in Figure 2.10. The left column of Figure 2.10 shows the traditional, more narrow view of IT's role (and thus of its value) in business operations. The column on the right reflects a more comprehensive view of IT as a potentially business resource.

A traditional or 'narrow' view of IT value can be questioned in light of the pervasive use of IT in organizations. Furthermore, the diverse range of

Figure 2.10 Organisational views on IT (from Venkatraman, 1997: 59)

Viewing IT as a commodity		Viewing IT as a strategic resource
We deploy IT to overcome weaknesses in our current operations		We view IT as a fundamental driver of future business activity
We see IT as an expense to be managed		We see IT as a resource to be leveraged
We view IT outsourcing as a threat to our operations		Our outsourcing strategy balances insourcing with outsourcing
We use one rigid criterion for assessing value from IT		We adopt multiple criteria for measuring IT value
Our IT operations reflect a captive, internal monopoly		Our IT operations act as a solutions integrator to business requirements

benefits and effects from IT owning, deploying and using IT require that IT's value no longer be thought of in financial terms only. As suggested by the right-hand column of Figure 2.10, a more comprehensive view of IT's value seems necessary (Strassman, 1990; Remenyi *et al*, 1995; Willcocks, 1994).

It can be argued that the way an organisation views IT and its role in business, will influence the approaches and methods being used to assess IT for value and ultimately the answers expected of IT value questions. Some approaches and methods are discussed next.

### 13. A range of methods is available to assess IT's value

The purpose of this section is show the wide and diverse range of methods available for assessing IT's value. The key features of the various types of methods will be discussed. More detailed discussions of some of the methods will be done in Chapter 3. (The perspective on IT evaluation methods, has primarily been sourced from: Renkema, 2000: 98 – 120; Remenyi *et al*, 1995: 63-67; Bacon, 1994: 32 and Willcocks and Lester, 1994:56-74.)

Renkema (2000: 101 – 104) classify IT investment appraisal methods into four basic types: the financial approach, the multi-criteria approach, the ratio approach and the portfolio approach. This classification will be used to illustrate the various types of evaluation methods.

Each of the evaluation types will now be briefly discussed:

***The Financial Approach:*** These methods only consider impacts that can be valued from a monetary perspective. These methods have traditionally

been prescribed for decisions about all corporate investment proposals and focus on the incoming and outgoing cash flows resulting from the proposed investment. When appraising a project in financial terms the purpose is to evaluate what the financial returns is, as a consequence of the earnings and expenditures that result from the investment. Financial methods utilise project cash flows based on the time value of money. These are also called DCF (discounted cash flow) techniques. All projected cash outflows and inflows associated with a project are reduced or discounted back to the present. All the cash flows are expressed in present money values. In this way cash flows across different projects and time periods have a common basis for comparison.

***The Multi-Criteria Approach:*** An IT investment will generally have both financial and non-financial impacts. Non-financial impacts include positive and negative impacts that cannot easily be expressed in monetary terms. It is therefore difficult to compare the financial and non-financial impacts on an equal basis. Methods from the multi-criteria approach address this problem by creating one single measure for each investment. Before using a multi-criteria method, a number of decision criteria have to be designed. Scores are then assigned to each criterion for each alternative. Weights are further used to establish the relative importance of the respective alternatives. Multiplying the scores on different decision criteria by the assigned weights and adding or multiplying them calculates the final score of an alternative.

***The Ratio Approach:*** Methods within this approach use ratios to compare organisational effectiveness. Examples of such ratios are: IT expenditure vs total turnover; and all yields that can be attributed to IT investments vs total profits. Other ratios, which are non-financial in nature, are for

instance, IT expenditure vs the total number of employees or IT expenditure in relation to output measures like products or services.

**The Portfolio Approach:** Portfolio methods combine the comprehensiveness of multi-criteria methods with the graphic opportunities of portfolios. The number of evaluation criteria is generally less than in multi-criteria methods, but the result is often more informative.

The key features and examples of each evaluation approach are presented in Table 2.4 (sourced from Renkema, 2000: 101).

**Table 2.4 Summary of IT evaluation approaches**

Characteristics	Type of Method	Financial Methods	Multi-criteria		Ratio methods		Portfolio Investment Methods		
			Information Economics	SIESTA	Return on Management	IT Assessment	Bedell's method	Investment Portfolio	Investment Mapping
Objects of the method	Breadth	Project-level	Project-level	Project-level	Organisation-level	Project- & organisation level	Product- & organisation level	Project-level	Project- and organisation-level
	Type of application area	Business investments	IT investments	IT investments	Business investments	In investments	In investments	In investments	In investments
Evaluation Criteria	Financial	Earnings and expenditures	Earnings and expenditures (average accounting rate of return)	Unclear	Own measures	Yields and costs	Implicit assessment, specification of expenditures required	Earnings and expenditures (NPV)	Earnings and expenditures (IRR)
	Non-financial	None	4 business criteria; 1 technological criterion	7 business criteria 6 technological criteria	Unclear	Different business criteria	Quality and importance	Business domain and It domain separately	3 types of benefits and 3 investment orientations
	Risks	Deduction from expectations or coverage through adjusted discount rate	1 business risk 4 technological risks	4 business risks 8 technological risks	None	None	None	Deductions from expectations, spread can be specified	Spread can be specified
Support of the decision-making process	None	None	Discusses examples and mentions stakeholder groups	None	None	None	Maximal appraisal is once a year	Discusses responsibilities, addresses role of mgmt	None
Measurement scale		Ratio & interval	Ordinal	Ordinal	Interval	Several scales	Ordinal	Ordinal & interval	Ordinal & interval

This brief overview has highlighted the many and diverse methods being used to assess the value of IT. By implication, the diversity of methods

means that diverse explanations of IT value are possible. This could add to management's dissatisfaction with IT value explanations.

#### 14. IT value is a complex concept

IT's business value is not a single question, but is composed of many different questions. It is not only evaluation methods that are diverse and complex. The concept of IT value is fundamental to all these each. From the literature overview, it appears that IT value could be defined or described in various ways. Without a clear and agreed definition of what IT value constitutes, IT evaluations cannot be effective and explanations of IT value will not be acceptable.

But what is meant by the term 'value'? De Bono (1995: 130,149) says that value is relative to need. De Bono also says that there is no such thing as value, unless there are people involved. A value is something that provides benefit or that opens up the possibility of benefit for someone. De Bono (1995: 142) adds: "*A computer may do a lot of wonderful things. But if you are not going to need those wonderful things, what does it matter?*"

Value depends on who is doing the valuing and what is at stake. Perceptions of Information System (IS) value are constantly being formed and re-formed (CSC, 1999: 1,4). Manning (1998: 201) states that value is a question of perception. Value is a combination of price and performance for a particular product or service.

The impact and distribution of IT benefits can vary widely across stakeholder groups. The more IT pervades an organization, the greater the problem becomes of managing the impact and effects that the introduction

of IT will initiate. As a result, these stakeholder groups could have different perceptions and views of IT value (Jurison, 1996: 264-269).

Hitt and Brynjolfsson (1996) make reference to the point that the issue of IT's business value is not a single question, but is composed of several related but quite distinct issues. *IT's business value could look different depending on the vantage point chosen.* This point is well illustrated by Hitt and Brynjolfsson (1996) who, from an organisational perspective, found that IT contributions to organisation output are significant. In contrast, Strassman (1997) shows from an industry level perspective, that there is no correlation between spending on IT and productivity. Both are addressing IT value issues, but from different perspectives.

The preceding discussion has highlighted the difficulties inherent to the IT value concept. In summary, IT value is influenced by what is being evaluated and by the perspective of the stakeholder concerned. It is a question of perceptions and can change over time as needs or opportunities change. It would appear that the IT value concept could contribute to difficulties with explanations of IT value. How IT value is measured, is closely linked to how IT value is defined. From a value perspective, IT measures must further correlate to business performance measures.

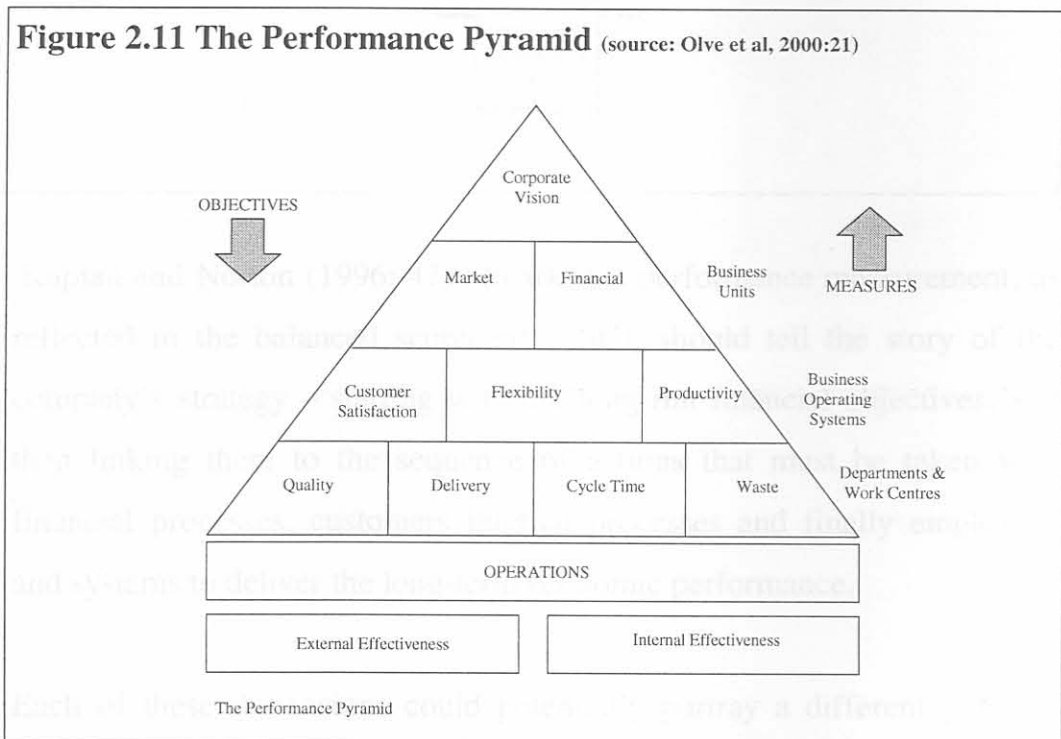
## 15. Approaches to performance measurement are changing

Key to the evaluation of IT value is to establish links or correlations between business performance and the performance of IT investments. Changes in the way business performance are being measured, must therefore also be accounted for in IT evaluations.



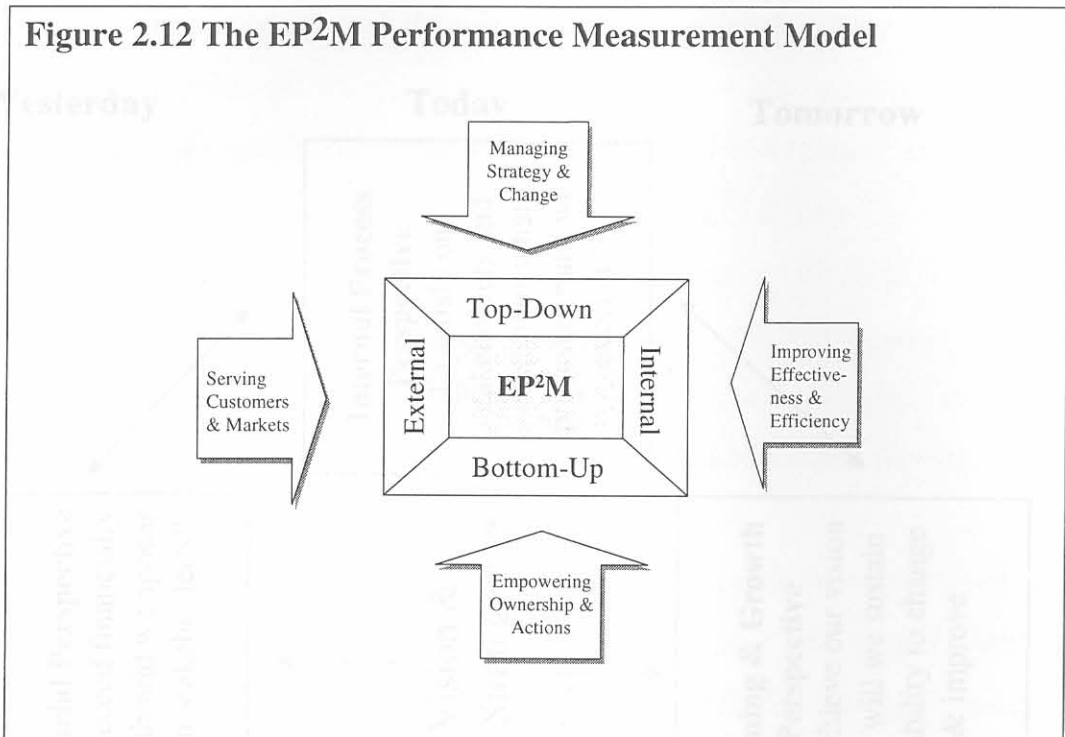
There is a trend towards more comprehensive approaches to performance measurement. This is typically reflected in the balanced scorecard concept introduced by Kaplan and Norton (1996). Olve *et al* (2000: 19 – 23) refer to other some models comparable to the balanced scorecard: The Maisel balanced-scorecard model is quite similar to that of Kaplan and Norton (refer to Figure 2.13). Maisel also defines four perspectives, like Kaplan and Norton, from which the business should be measured. Maisel, however, uses a Human Resources perspective instead of a Learning and Growth perspective. There is also the performance pyramid proposed by McNair, Lynch and Cross. (See Figure 2.11) It is a customer-oriented model, linked to the company's overall strategy.

**Figure 2.11 The Performance Pyramid** (source: Olve et al, 2000:21)



The EP<sup>2</sup>M (which stands for effectiveness progress and performance measurement) model advocated by Adams and Roberts provides for external measures, internal measures, top-down measures and bottom-up

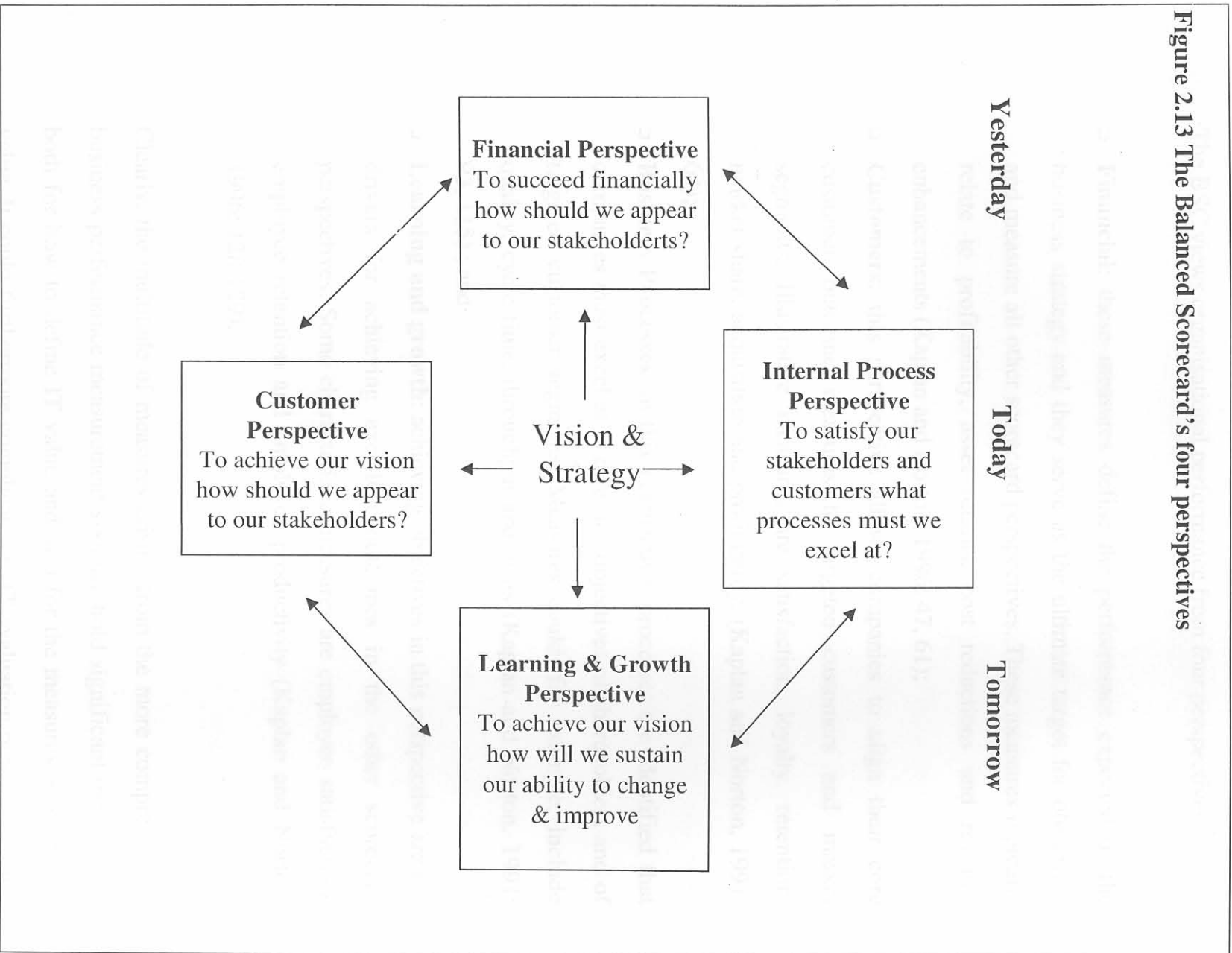
measures. Figure 2.12 shows more detail of the EP<sup>2</sup>M performance measurement model.



Kaplan and Norton (1996: 47) remark that performance measurement, as reflected in the balanced scorecard (BSC), should tell the story of the company's strategy – starting with the long-run financial objectives, and then linking them to the sequence of actions that must be taken with financial processes, customers internal processes and finally employees and systems to deliver the long-term economic performance.

Each of these dimensions could potentially portray a different point of viewing IT value. The four dimensions of the balanced scorecard are shown in Figure 2.13. The focus of each dimension, i.e., yesterday, today, tomorrow is also shown.

Figure 2.13 The Balanced Scorecard's four perspectives



The BSC views organisational performance from four perspectives:

- **Financial:** these measures define the performance expected of the business strategy and they serve as the ultimate target for objectives and measure all other scorecard perspectives. These measures typically relate to profitability, asset returns, cost reductions and revenue enhancements (Kaplan and Norton, 1996: 47, 61);
- **Customers:** this perspective allows companies to align their core customer outcome measures to targeted customers and market segments. Illustrative measures are satisfaction, loyalty, retention, market share, acquisition and profitability. (Kaplan and Norton, 1991: 63);
- **Business Processes:** in this perspective, processes are identified that companies must excel at to meet the objectives of shareholders and of targeted customer segments. Measures could, for example, include quality, cycle time, throughput and costs (Kaplan and Norton, 1991: 93, 115).; and
- **Learning and growth:** achieving objectives in this perspective are the drivers for achieving excellent outcomes in the other scorecard perspectives. Some characteristic measures are employee satisfaction, employee retention and employee productivity (Kaplan and Norton, 1996: 128-129).

Clearly, the multitude of measures arising from the more comprehensive business performance measurement systems, hold significant implications both for how to define IT value and also for the measures depicting IT value. It could furthermore complicate the IT evaluation process and thus also the resulting explanations of IT value.

## 16. Conclusion

Chapter 2 has discussed the growing interest of business managers in IT's value and related issues. Explanations of IT value are not always sufficient. It was shown that problems around unsatisfactory explanations of IT value forms part of a complex network of inter-related problems. As a result, the research problem has been phrased as: **“Why are business managers dissatisfied with explanations of IT value?”** It is believed that this will result in a better understanding of the phenomenon, which will in turn, facilitate the development of more effective approaches.

The literature overview will continue in the next chapter and will concentrate on research and approaches aimed at addressing the research problem. Chapter 3 will develop the research objectives and a set of supporting research questions. After discussing the research, the chapter sets out the overall approach to be adopted for the research into the issue of dissatisfaction with explanations of IT value. This overall research approach will lead to specific steps to achieve the research objective.