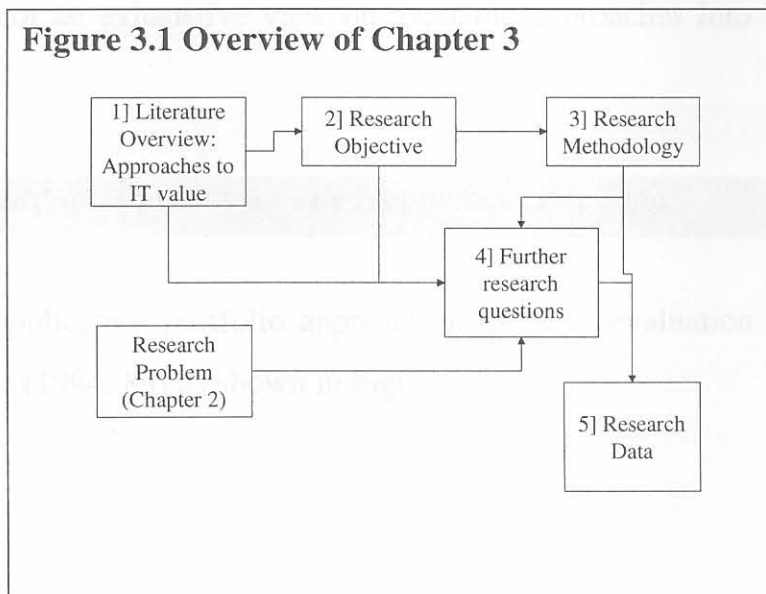


## The Literature Overview, Research Objective and Research Approach

### 1. Introduction

Chapter 2 presented the research problem as: “Why are business managers dissatisfied with explanations of IT value?” Chapter 2 further outlined, through a literature overview, a complex network of inter-related problems around the issue IT value.

Chapter 3 consists of two distinct parts. In the first part, the literature overview, which has been partially covered in Chapter 2, continues. The emphasis of the literature overview in this chapter is to examine various approaches to resolve difficulties regarding the issue of IT value. Figure 3.1 summarises the structure of Chapter 3.



A statement of the research objective concludes the first part of the chapter. The second part of Chapter 3 addresses the overall research

approach and research methodology. The development of further, more specific research questions which elaborate on and further detail the research problem, is addressed towards the end of Chapter 3. The literature overview that follows starts with an examination of the central issue of IT value.

## **2. IT value has been and still is the subject of much study**

Researchers have employed a range of different approaches to address the issue of IT value. Each of these approaches concentrates on a particular aspect of IT value, for instance, expressing IT value in financial terms, using different measures (by implication acknowledging that there is no universal definition of IT value), developing a variety of IT effectiveness measures and proposing the use of critical success factors.

The approaches considered in this chapter are viewed as a comprehensive but not an exhaustive view on available approaches into the issue of IT value.

## **3. IT evaluation approaches: The Application Portfolio**

An application portfolio approach towards IT evaluation is proposed by Ward (1994: 84) as shown in Figure 3.2.

**Figure 3.2 Application Portfolio approach** (Source: Ward, 1994: 85)

Strategic	High Potential
Applications which are critical to sustaining future business strategy	Applications which may be important in achieving future success
Applications on which the organisation currently depends for success	Applications which are valuable but not critical to success
Key Operational	Support

In essence, this approach involves the classification of IT for investment appraisal purposes. Classification is done according to two key parameters namely 1] the role of IT in the business and 2] the contribution that the IT is expected to make. The framework distinguishes between strategic, high potential, key operational and support investments.

#### 4. IT evaluation approaches: Options-Pricing Models

Options-pricing models are advocated by Dos Santos (1994: 134) for the financial analysis of strategic IT investments. Dos Santos (1994: 137-138) distinguishes between 'now-or-never' IT projects and projects that could be delayed. For the 'now-or-never' projects, the decision to invest must be made immediately, because most of the benefits go to 'early movers'. Such projects have a positive NPV (net present value) only if they are undertaken right away. For 'now-or-never' projects it is appropriate to make decisions using the NPV method.

Using the NPV for projects that can be delayed, may be inappropriate. For such projects, a positive NPV does not necessarily mean for the investment to proceed. Delaying such a project may prevent taking on a 'bad' project. Strategic IT projects may even have a negative NPV. These could turn out to be valuable investments if events turn out favorably. Cost and benefit uncertainties may be reduced by undertaking a preliminary investigation (PI). The aim is to determine under what circumstances would it be profitable to invest in the strategic IT project (SIT). The choice is compared to buying a call option instead of a firm's stock. Conducting a PI provides management with the option to invest in a project at a later date, if it appears to be a profitable investment at that time (Dos Santos, 1994: 139). Dos Santos proposes that the options-pricing model of Black and Scholes be used to determine the value of a Preliminary Investigation.

## 5. IT evaluation approaches: Productivity, Business Profitability and Consumer Surplus

Hitt and Brynjolfsson (1996: 122) maintain that the issue of IT value is not a single question, but is composed of related, but distinct questions. The questions they pose are 'Have investments in IT increased productivity?'; 'Have investments in IT improved business profitability?'; and 'Have investments in IT created value for consumers?'

In context of the three questions, the terms used by Hitt and Brynjolfsson (1996: 121) are defined in the following way:

1. Productivity – this measure is concerned with 'more' output for a given quantity of inputs.

2. Business profitability – this measure considers whether firms are able to gain competitive advantage and earn higher profits through IT.
3. Consumer surplus – this measure is about the size of benefits that have been passed on to consumers.

Hitt and Brynjolfsson find evidence that IT may be increasing productivity and consumer surplus, but not necessarily leading to business profits. *“Our empirical examination confirmed that, like any multidimensional object, IT’s value can look different depending on the vantage point chosen.”*

## 6. IT evaluation approaches: Financial Market Evaluation

The financial market valuation of firms can be used to estimate the intangible costs and benefits of IT according to Brynjolfsson and Yang (1997:147). They explain that the high levels of output associated with company investments, reflect both contributions of computers (IT) and of expensive, unmeasured and intangible assets. Such assets usually coincide with investments in IT. Typically these intangible and invisible assets are knowledge and information.

Brynjolfsson and Yang conclude that the costly investments in software, training and organisational transformation that accompany IT investments can be viewed as creating intangible assets that do not appear on conventional balance sheets. They maintain that the combined asset, consisting of computer capital and the intangible assets, may well earn normal returns (given the total cost). If only computer capital is measured, and then it could appear to be yielding excess returns (Brynjolfsson and Yang, 1997: 161).

## 7. IT evaluation approaches: Productivity of IT spending

Brynjolfsson and Hitt (1993: 47 – 64) use statistical methods to establish whether IS spending is productive. They assessed several econometric models regarding the contribution of IT to firm-level productivity. They base their approach on the standard production theory, where the output of a firm is a function of the inputs it uses:

$Q = f(C, K, S, L, i, t)$  and where the symbols represent the following: Q = quantity of output; f = production function; C = computer capital; K = non-computer capital; S = IS staff labour; L = other labour and expenses; i = industry or sector in which the business operates; and t = the year in which the observation was made. (The output and each of the input variables can be measured in either physical units or dollars).

Their study used firm-level data of IS spending for the period 1987 to 1991. The data set includes 380 large US firms. In contrast to Strassman's industry level analysis, their results show that IS contributions to organisational output is substantial and statistically significant. ROI (return-on-investment) for computer capital averaged 54% in manufacturing and 68% for manufacturing and services combined. They conclude that the productivity paradox has disappeared in the sample of firms they have investigated.

## 8. IT evaluation approaches: IT effectiveness measures

The effectiveness measures developed by Seddon *et al* (1998: 165-167) can contribute towards IT evaluation. They propose a two-dimensional matrix to classify IT effectiveness measures. The matrix was developed in response to the lack of clarity about what measures are appropriate in a particular context. One of the dimensions of the matrix is the type of IT system being studied, the other dimension refers to the stakeholder in whose interests the IT is being evaluated. The dimensions are explained further in Table 3.1 below.

<b>Type of system being assessed</b>	<b>Stakeholders</b>
<ul style="list-style-type: none"> <li>• a single IT application</li> </ul>	<ul style="list-style-type: none"> <li>• an independent observer</li> </ul>
<ul style="list-style-type: none"> <li>• a type of IT or IT application</li> </ul>	<ul style="list-style-type: none"> <li>• an individual user</li> </ul>
<ul style="list-style-type: none"> <li>• all the IT applications used by an organisation or a sub-organisation</li> </ul>	<ul style="list-style-type: none"> <li>• a group of users</li> </ul>
<ul style="list-style-type: none"> <li>• an aspect of a systems development methodology</li> </ul>	<ul style="list-style-type: none"> <li>• the management or owners of an organisation</li> </ul>
<ul style="list-style-type: none"> <li>• the IT function of an organisation or sub-organisation</li> </ul>	<ul style="list-style-type: none"> <li>• a country or mankind</li> </ul>

Seddon *et al* (1997:174) conclude that in a world of conflicting human interests and vastly different IT systems - varied, sharply-focused measures of IT effectiveness are needed for different purposes. Other issues identified are the huge range of measures that is required as well as the importance of identifying the context in which IT effectiveness is being evaluated.

## 9. IT evaluation approaches: Financial Analysis of IT Investments

Research by the Working Council for Chief Information Officers (1997) (Working Council for CIOs) argues that the emerging prescription by academics to abandon financial measurement is inappropriate. It is better to upgrade a firm's cost-benefit "toolkit" with a portfolio of more sophisticated measures. These measures need to reflect the diversity of the projects to be undertaken. ROI assessments should not be imposed upon all projects in a 'one-size-fits-all' way.

The Working Council for CIOs (1997) proposes a 2x2 matrix to categorise investments for the purpose of deciding on a suitable financial evaluation method. The dimensions of the matrix are: 1] the complexity of cash flows and 2] the uncertainty of the cash flows. The matrix is shown in more detail in Figure 3.3 (1997: 8) below.

**Figure 3.3**

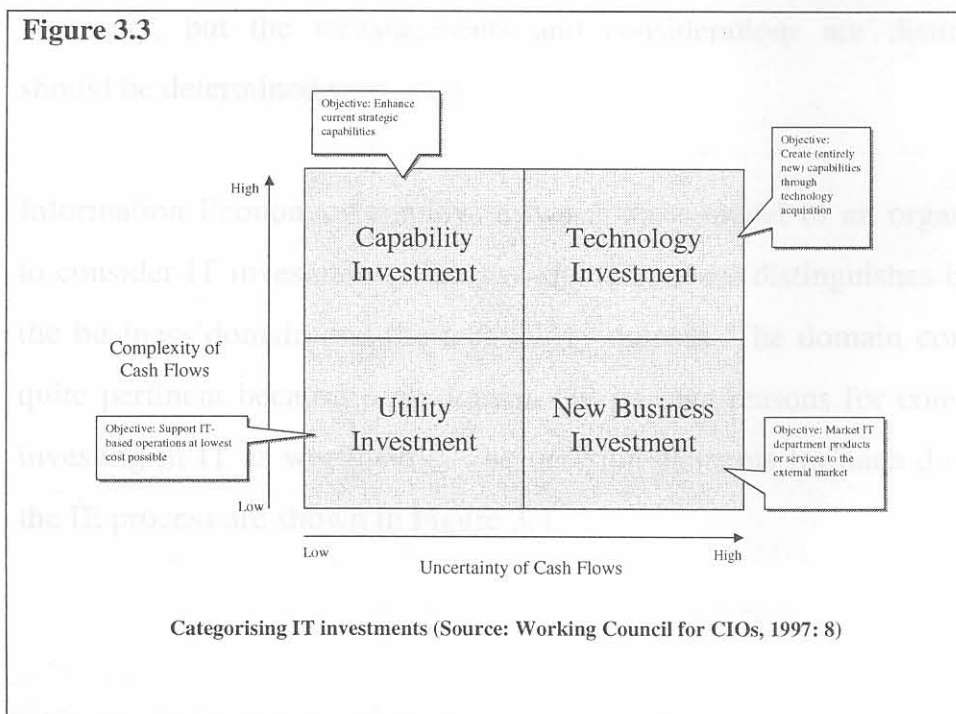


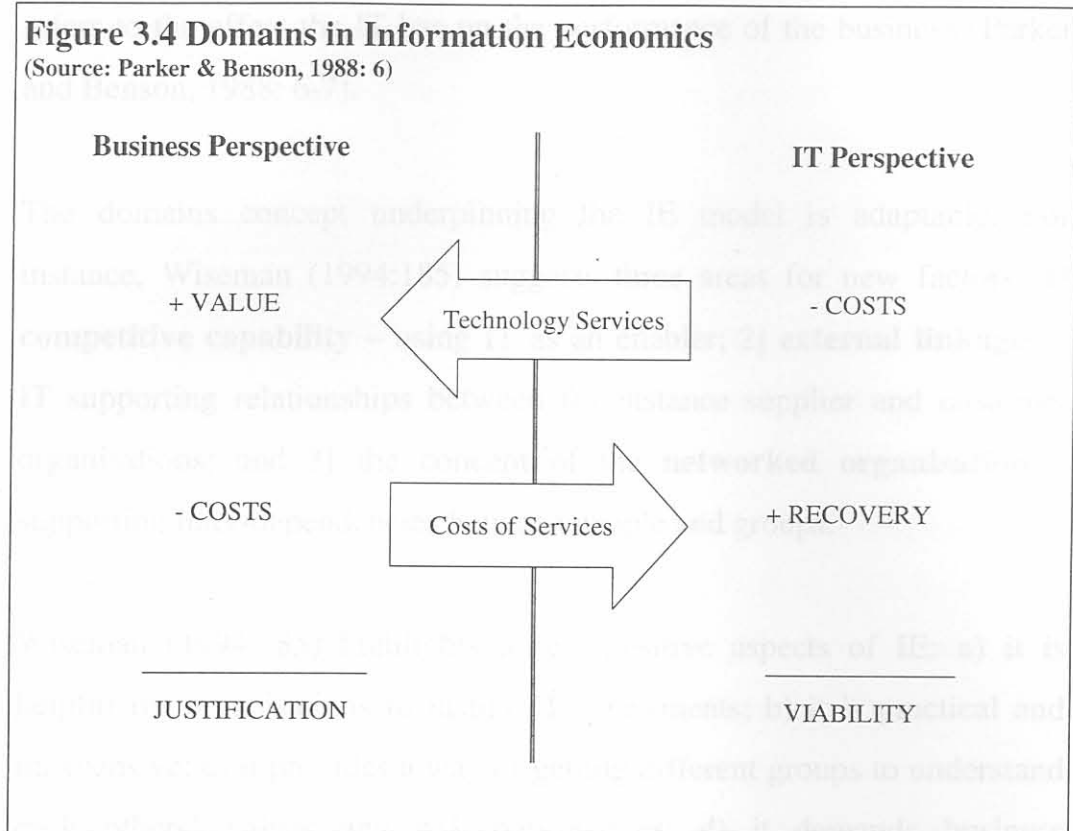


Figure 3.3 shows the four possible types of IT investments, namely: Capability Investment; Technology Investment; Utility Investment and New Business Investment. They propose that the matrix be used as a guide to choose the most suitable method, eg., use ROI/payback methods for Utility IT investments or real options for Technology Investments. The Working Council for CIOs (1997: 10) maintains that earnings must also be attributed to 'intangible' benefits to reveal the true value of IT.

### 10. IT evaluation approaches: Information Economics

Parker and Benson (1988: 5) introduced the concept of Information Economics (IE). They describe IE, at the one level, as a collection of tools for quantifying benefits and costs for IT projects. At another level, IE is a process of decision-making. In this decision-making process, the business justification for IT is separated from the elements of technological viability. Both (i.e., business justification and technological viability) are necessary, but the measurements and considerations are distinct and should be determined separately.

Information Economics employs a two-domain model of an organisation to consider IT investments. The two-domain model distinguishes between the business domain and the technology domain. The domain concept is quite pertinent because each domain has its own reasons for considering investing in IT as worthwhile. The decision elements for each domain in the IE process are shown in Figure 3.4.



In a discussion of IE, Wiseman (1994: 171-187) points out that IE differentiates between benefits and values. Benefits are what one pays for, while value is what one takes risks for. Benefits can be considered using knowledge and logic. Value according to IE is the total positive impact of the information system(s) on the organisation. Negative impacts need also be considered e.g. actual outflow of money or disruptions of work patterns or time taken to learn the new skills.

From a technology perspective, the viability of the investment is based on the project resources available, as compared to the resources needed to successfully develop and implement the project. In cases of charge back to users, this translates into a cost-recovery analogous to a revenue stream for a business unit. To be viable, the cost recovery must be sufficient to cover all potential costs. From a business perspective, the focus is on value. This

refers to the effect the IT has on the performance of the business (Parker and Benson, 1988: 6-7).

The domains concept underpinning the IE model is adaptable. For instance, Wiseman (1994:185) suggests three areas for new factors: 1] **competitive capability** – using IT as an enabler; 2] **external linkages** – IT supporting relationships between for instance supplier and customer organisations; and 3] the concept of the **networked organisation** – supporting inter-dependencies between people and groups.

Wiseman (1994:185) highlights a few positive aspects of IE: a) it is helpful for organisations to justify IT investments; b) it is practical and inexpensive; c) it provides a way of getting different groups to understand each others' values and risk perspectives; d) it demands business management interest and willingness to co-operate; and e) it is flexible and adaptable.

Willcocks and Lester (1994:72), on the other hand, point out some drawbacks concerning IE. The draw-backs are that IE a) could become mechanistic; b) could be time consuming; and c) may lack credibility with senior management because of the subjective nature of its scoring.

They (Willcocks and Lester, 1994) maintain that much depends on the careful interpretation of the results of the IE process. The value for decision makers could come from the heightened awareness of the issues involved. Willcocks and Lester suggest that IE is one of the more comprehensive approaches for assessing the potential of an organisation's IT investments. IE needs, however, to be tailored, developed and extended

to meet the evaluation needs of different organisations. IE is a major contribution for advancing the modern evaluation practice.

### 11. IT evaluation approaches: Return-on-Management

Strassmann (1997: 1-2) developed a diagram of Return-on-Equity vs the corresponding per capita expenditures for computers for 468 major US, European and Canadian firms for the year 1994. From the diagram it appears that IT is not a key to profitability. He states that it is absurd for a Chief Executive Officer (CEO), Chief Operating Officer (COO) or Chief Financial Officer (CFO) to demand that the CIO demonstrates how computers relate to profits simply and directly. Strassman says that the best computerisation can achieve is to make management more effective and employees more productive. Value from information technologies can be extracted only by operating executives who have harmonised their organisations to earn a profit in a competitive market place (Strassmann, 1997: 5).

Strassmann introduced a ratio called 'Return-on-Management' (ROM) or Information Productivity (IP) (Strassmann, 1997: 8-13; Willcocks and Lester: 1994:70). Return-on-Management is defined as Management Value-Added vs. the costs of Management. Management Value-Added is, according to Strassmann, what is left over after absolutely all costs are fully accounted for. The costs of management can be approximated as the Sales, General & Administrative expenses. Strassmann argues that there is ample evidence that firms employing identical land, identical labour, identical computer technology or comparable amounts of capital assets deliver vastly different financial results. The only difference is the skills and capabilities of management. All value creation, in an information-

based enterprise, must be attributed to management who coordinate, motivate, lead and organise resources.

Return-on-Management is thus based on the added value for the organisation that management provides. ROM equals management value added, divided by the costs of management. If ROM is calculated before, and then after, IT is applied to the organisation, then the IT contribution to the business can be assessed (Remenyi et al, 1995: 70).

## 12. IT evaluation approaches: The Six Milestones Approach

Silk (1991: 70) states that a method is required to deal with both the hard and soft benefits of IT. Silk first describes a special case of the so-called ‘**must do**’ projects. Organisations have to do these projects if they are to remain in business. There are no practical alternatives. The method should be aimed at enabling investment decisions.

For projects other than those in the ‘**must do**’ category, Silk is proposing a method that has 6 milestones in building a progressively better case for an IT investment.

The first milestone is called an “**Act of Faith**”. It is an extreme form of intuitive judgment. Senior management believes the project/investment is right for the organisation and takes responsibility for the decision. This is followed by the second milestone, where causal logic type of arguments are used for the investment. A cause-and-effect chain is identified where the provision of an information system is linked with a business benefit. The size of the benefit is, however, not determined.

The third milestone is to monitor the direction of change. This builds on the causal logic argument where an indicator is identified, to measure after implementation whether the organisation has indeed moved in the intended benefit direction. The fourth milestone has to do with monitoring the size of the change. The size of the indicator is estimated upfront and the change is then checked quantitatively when the system is in operation.

The fifth milestone aims to assess the value of the change. Those observable quantities (the indicators) are given a weighting in order to compare different types of benefits with each other. The sixth milestone is to assess the financial impact of the change. Financial values are attached to each of the benefits. These are then compared to each other and their impact on business performance can also be established.

### 13. Some important leads are evident from the examination of IT value related research

The first lead is obtained from Seddon *et al* (1998). They highlight the importance of understanding the **context** of an IT evaluation. One must be clear on the **type of system** being evaluated and also **from which stakeholder perspective** the evaluation is being conducted. Parker and Benson (1988) refer to the two different domains to be considered, namely the business domain and the technology domain.

Hitt and Brynjolfsson (1996) concentrate on the multi-dimensional nature of IT value. They argue the answer one gets, depends on the question being asked. They investigated three related, distinctive questions (business profitability, productivity and consumer surplus). Each of the questions represents an IT value perspective.

The Working Council for Chief Information Officers, Dos Santos, Strassmann as well as Brynjolfsson and Hitt focus on ways to cope with the difficulties and complexities to establish a financial view of IT value. Brynjolfsson and Yang (1997) demonstrate the importance of intangible assets in realising value from IT. Their approach to IT value assessment is also financial in nature. They mention specifically that excluding the costs of intangible assets, may distort or misrepresent IT value, since the evaluation would be based on IT investment costs only.

Any approach to IT evaluation must recognise the different types of IT investment projects. This is pointed out in the work of Ward (1994), Parker and Benson (1988) as well as by the work of the Working Council for CIOs (1997).

Common to all the evaluation approaches, is the complexity associated with the evaluation of IT. This complexity manifests in the various frameworks being proposed, the variety of criteria, the need for multiple measures of IT effectiveness and the need for alternative (and quite diverse) evaluation methods. From Hitt and Brynjolfsson's (1996) work, it is evident that IT value is an intricate concept in itself. Dos Santos (1994) even argues that the value of an IT investment can change over time according to changing circumstances.

The last feature of the evaluation approaches reviewed, is how all endeavour to cope with the difficulties and uncertainties associated with measuring IT benefits. The six milestone methodology of Silk (1991) is a good example.

## 14. The Research Objective

With the literature overview completed and the research problem defined, the research objective can now be defined. The purpose of defining the research objective is to specify the intended outcome of the research study.

The starting point for the formulation of the research objective, is the research problem, formulated as: “Why are business managers dissatisfied with explanations of IT value?”. The literature overview in Chapter 2 has furthermore indicated that this could be part of a complex network of inter-related problems.

The literature overview also indicates that there could be many factors contributing to management’s dissatisfaction with explanations of IT value. How these factors relate to each other and to the research problem is not clear. The research objective has therefore been formulated as follows: **“To develop a framework which clarifies the reasons why business managers are dissatisfied with explanations of IT value.”**

This objective could lead to a greater understanding of the research problem in its bigger context and through this enhanced understanding, contribute towards answering or resolving the research problem. In addition, the framework should provide some guidance to business and IT managers on how to deal with IT value related issues, such as dissatisfaction with explanations of IT value. The framework should also facilitate responses to the more specific research questions presented later in this chapter.



The formulation of the research problem and the corresponding research objective, together with the literature overview, allow the selection of a research approach and methodology. However, before the research methodology is discussed, the literature will be scrutinized for related frameworks.

### 15. A framework developed for the HR function present some guidelines

The overview of the literature also considered the development of similar frameworks for other organisational functions. A comparable framework applicable to the Human Resources (HR) function, was identified. The logic that guided the development of this framework will now be explored.

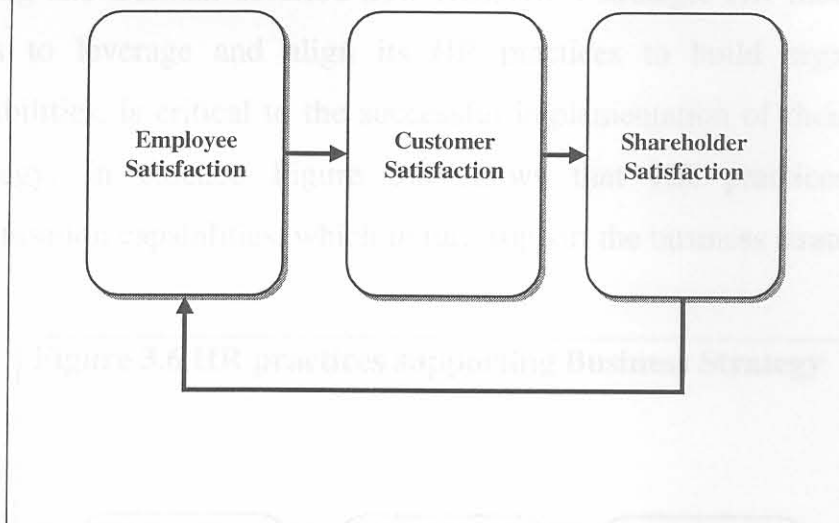
According to Yeung and Berman (1997:321) the measurement of HR effectiveness (or value) is considered the top priority for HR executives. Conceptual linkages between the HR function and business performance are not well developed. Existing HR measures are furthermore not formulated to capture the impact of HR on business performance.

“Does HR make a difference in business results?” is the *fundamental* question. Following on an affirmative answer, i.e., yes HR does make a difference in business results, a framework is needed to indicate how HR practices can impact on business performance.

Yeung and Berman propose an integrative framework that builds on the Balanced Scorecard (BSC) concept and a strategic HR model. The BSC defines *what* should be focused upon, the strategic HR model identifies *how* a firm can leverage its HR practices for business success. Figure 3.5

shows how the BSC could be interpreted from an employee or staff perspective (Yeung and Berman, 1997: 322-324).

**Figure 3.5 From Employee Satisfaction to Shareholder Satisfaction**



The BSC defines what it takes for a company to succeed. Two premises underlie the BSC. The first premise is that for success in the long run, the expectations of three stakeholders (employees, customers and shareholders) must be satisfied. The second premise is that all three stakeholders are inter-related. Employee or staff attitudes and behaviour influence the level of customer satisfaction and retention. In turn, customer attitudes and behaviour influence shareholders satisfaction. This could again affect employee or staff satisfaction.

The BSC was used to guide the development of a framework to indicate how HR practices can impact on business performance. It has basically three purposes:

- To help HR professionals better articulate the value of the HR function;

- To specify ways in which HR can contribute to business performance; and
- To stimulate the development of HR measures that demonstrate the value added by HR.

Yeung and Berman describe how KODAK's strategic HR model, which aims to leverage and align its HR practices to build organisational capabilities, is critical to the successful implementation of their business strategy. In essence Figure 3.6 shows that HR practices support organisation capabilities, which in turn support the business strategy.

**Figure 3.6 HR practices supporting Business Strategy**



The following questions were posed to evaluate the impact of HR practices on business (Yeung and Berman, 1997: 328):

- How can HR practices truly contribute to the critical success factors as outlined in the BSC?
- What are the most viable and effective HR measures to demonstrate HR's value-add?

Yeung and Berman then proceeded to combine the two models into an integrated framework shown in Figure 3.7

**Figure 3.7 Integrative model connecting strategic HR framework to key result areas**



The framework shows 2 key inter-relationships. In the first instance, HR practices are viewed as key drivers in building organisational capabilities, enhancing employee satisfaction and shaping customer satisfaction. Both employee and organisational capability can impact on customer satisfaction. In the second instance, organisational capabilities are the key drivers to implement the business strategy, to impact on customer satisfaction and eventually to contribute to shareholder value.

## 16. Qualitative research is about understanding people and social contexts

This section will commence with an indication of the preferred research approach and the rationale for this preference. It will be followed by a general discussion of the chosen research approach.

An interpretive approach to qualitative research is considered appropriate for the research problem at hand. In the first place, interpretive research has emerged as a valid and important approach to information technology/information systems research (Klein and Myers, 1999: 67). Walsham (1993: 4) maintains that broadly interpretive methods of research provide a way of increasing our understanding of critical issues related to computer based information systems. Walsham (1993: 4) says that the importance of organizational issues with respect to computer-based information systems is well recognized by practitioners.

The research problem is managerial and organisational in nature. In considering some of the top IS issues (identified by IS executives in the USA), it is notable that all of the issues have a strong organizational emphasis, rather than a technical emphasis. These issues include strategic planning, competitive advantage, organizational learning, IS's role and contribution and the alignment of the IS function in the organization (Frenzel, 1992: 23 – 28).

Walsham (1993:4) proceeds by saying that research literature on IS organizational issues reflects a rational-economic interpretation of organizational processes, and a positivist methodology which is based on the view that the world exhibits objective cause-effect relationships which can be discovered, at least partially, by structured observation. Many researchers have noted the limitations of such approaches.

Roode (1993: 62, 64) concluded that progress in IS research can only be made if the fundamental social nature of IS is accepted. If the nature of information systems is fundamentally social, then the spectrum of research philosophies in contemporary social science, for instance interpretivism,

must be taken into account. It is argued that whatever research approach is followed, that approach should heed the fact that information systems are developed by people for people. Moreover, the research approach must be able to cope with the complexity brought about by the inter-disciplinary nature of the IS problem domain. This will always be a matter of complex, unquantifiable trade-offs between the needs of technologists, individuals, organizations and society. This outlook is echoed by Smit (1999: 219) who state that there is a growing interest in the IS field about the use of qualitative research methods. The interest is due to an increasing need to obtain an understanding of IS related issues within its social and institutional context.

Klein and Myers (1999: 67) say that interpretive research can help IS researchers to understand human thought and action in social and organizational contexts; it has the potential to produce deep insights into information systems phenomena including the management of information systems and information systems development.

Fouche and De Vos (1998: 72) state that a qualitative research approach would be suitable for the following situations: research that cannot be done experimentally for practical and/or ethical reasons; research that delves in depth into complexities and processes; research for which the relevant variables have yet to be identified; research that seeks to explore where and why policy and practice do not work; research on unknown societies or innovative systems; research on informal and unstructured linkages and processes in organizations; and research on real, as opposed to stated, organizational goals. Qualitative research will now be discussed in more detail.

Qualitative research deals with data that are principally verbal. In contrast, quantitative research deals with data that are principally numerical (de Vos (ed.), 1998: 15). Strauss and Corbin (1990: 17) consider qualitative research as research that produces findings by means other than statistical procedures or other means of quantification. Some of the data may be quantified, but the analysis is qualitative.

Quantitative research methods were originally developed in the natural sciences to study natural phenomena. Typical quantitative research methods include laboratory experiments, econometrics and mathematical modeling. Qualitative research methods were developed, on the other hand, in the social sciences to enable researchers to study social and cultural phenomena. Action research, case study research and ethnography are typical qualitative research methods. Qualitative data sources include observation, interviews and questionnaires, documents and texts as well as the researcher's impressions and reactions. Qualitative research methods are designed to help researchers understand people and the social and cultural contexts within which they live (Myers, 1997: 2).

Some of the reasons for doing qualitative research concern the nature of the research problem, for instance, research that attempts to uncover the nature of a person's experience with a phenomenon. Qualitative research methods can also be used to uncover and understand what lies behind any phenomenon about which little is yet known. It can further be used to gain novel and fresh viewpoints on things about which much is already known. Qualitative methods can give intricate details of phenomena that are difficult to convey with quantitative methods (Strauss and Corbin, 1990: 19).

Myers (1997: 1) describes qualitative research as involving the use of qualitative data such as interviews, documents and participant observation to understand and explain social phenomena. Myers maintains further that there has been a general shift in IS research away from technological to managerial and organizational issues, hence an increasing interest in the application of qualitative research methods.

Qualitative research may or may not be interpretive, depending upon the underlying philosophical assumptions of the researcher (Klein and Myers, 1999: 69). Qualitative research can be done with a positivist, interpretive or critical stance. Generally speaking, research can be classified as positivist if there is evidence of formal propositions, quantifiable measures of variables, hypothesis testing, and the drawing of inferences about a phenomenon from a representative sample to a stated population (Klein and Myers, 1999: 67).

Research would be critical if the main task is seen as being one of social critique, whereby the restrictive and alienating conditions of the status quo are brought to light. Critical research seeks to be emancipatory in that it aims to help eliminate the causes of unwarranted alienation and domination and thereby enhance the opportunities for realizing human potential (Klein and Myers, 1999: 67).

In Table 3.2 below, Schurnik (1998: 242 - 243) compares the underlying philosophical assumptions of qualitative and quantitative research.



Table 3.2 Comparing the underlying philosophical assumptions	
Qualitative Research	Quantitative Research
Uses an <i>inductive</i> form of reasoning: develops concepts, insights and understanding from patterns in the data.	Uses a <i>deductive</i> form of reasoning: collects data to assess preconceived models, hypotheses and theories.
Uses an <i>emic</i> perspective of inquiry – derives meaning from the subjects' perspective	Uses an <i>etic</i> perspective: the meaning is determined by the researcher.
Is <i>idiographic</i> : thus aims to understand the meaning that people attach to everyday life.	Is <i>nomothetic</i> : aims to objectively measure the social world, to test hypotheses, and to predict and control human behavior.
Regards reality as <i>subjective</i> .	Regards reality as <i>objective</i> .
Captures and discovers meaning once the researcher becomes immersed in the data.	Tests <i>hypotheses</i> that the researcher starts off with.
<i>Concepts</i> are in the form of themes, motifs and categories.	<i>Concepts</i> are in the form of distinct variables.
Seeks to <i>understand</i> phenomena.	Seeks to <i>control</i> phenomena.
Observations are determined by information <i>richness</i> of settings, and types of observations used are modified to enrich understanding.	Observations are systematically undertaken in a <i>standardized</i> manner.
Data are presented in the form of <i>words, quotes</i> from documents and <i>transcripts</i> .	Data are presented by means of <i>exact</i> figures gained from precise measurement.
The research design is <i>flexible</i> and unique. It evolves throughout the research process. There are no fixed steps that should be followed. The design cannot be exactly replicated across research studies.	The research design is standardized according to a <i>fixed</i> procedure and can be replicated.
Data are analyzed by extracting <i>themes</i> .	Data analysis is undertaken by means of standardized <i>statistical</i> procedures.
The unit of analysis is <i>holistic</i> , concentrating on the relationships between elements, contexts, etc. The whole is always more than the sum.	The unit of analysis is variables that are <i>atomistic</i> (elements that form part of the whole).

Interpretive methods of research start, according to Walsham (1993: 5), from the position that our knowledge of reality, including the domain of

human action, is a social construction by human actors and that this applies equally to researchers. There is thus no objective reality that can be discovered by researchers and replicated by others, in contrast to the assumptions of positivist science. Interpretivism is thus an epistemological position concerned with approaches to the understanding of reality and asserting that all such knowledge is necessarily a social construction and thus subjective.

Research can be regarded as interpretive if it is assumed that our knowledge of reality is gained only through social constructions such as language, consciousness, shared meanings, documents, tools and other artefacts. Interpretive research does not predefine dependent and independent variables, but focuses on the complexity of human sense making as the situation emerges; it attempts to understand phenomena through the meanings that people assign to them (Klein and Myers, 1999: 67; Myers, 1997: 4).

Schurnik (1998: 239) maintains that the quantitative (research) paradigm is based on positivism that takes scientific explanation to be based on universal laws. The main aims are to objectively measure the social world, to test hypotheses and to predict and control human behavior. The *qualitative* paradigm on the other hand, stems from an antipositivistic, interpretative approach. It is holistic in nature and the main aim is to understand social life and the meaning that people attach to everyday life.

Schurnik (1998: 243 - 244) continues by saying that the qualitative research paradigm, in its broadest sense, refers to research that elicits participants' accounts of meaning, experience or perceptions. It also produces descriptive data in the participants' own written or spoken

words. The qualitative researcher embarks upon a voyage of discovery rather than one of verification. The qualitative researcher is concerned with:

- understanding rather than explanation;
- naturalistic observation rather than controlled measurement; and
- the subjective exploration of reality from the perspective of an insider, as opposed to the outsider perspective that is predominant in the quantitative paradigm.

An interpretive approach to qualitative research was discussed in the preceding sections. Since the research problem (i.e., “Why are business managers dissatisfied with explanations of IT value?”) is primarily organisational and managerial in nature, an interpretive approach to qualitative research is considered appropriate. The next step in the research design is to select an appropriate research methodology. This methodology will be discussed next.

### **17. The Grounded Theory Method will be applied to the research problem**

An interpretive approach to qualitative research was motivated as suitable for the research problem and research objective at hand. Interpretive approaches have further been used for research into IT evaluation issues. Farbey *et al* (1999: 193) have used an in-depth, interpretive study to develop a theoretical basis for matching IT projects with evaluation methods. Case studies were the primary research instrument.

This section focuses on the Grounded Theory Method (GTM), a specific application of the interpretive research approach. The Grounded Theory Method is considered an appropriate methodology for the development of

a framework around management's dissatisfaction with explanations of IT value. GTM is a qualitative research strategy that is becoming more popular in IS research (Smit, 1999: 219). Grounded theory will be used to develop the framework or theory to gain better insights and understanding as to why business managers have difficulties with the business value of IT.

De Vos and Van Zyl (1998: 265-266) describe the GTM as the creation of theory based more on observation (and thus induction) than on deduction. It is concerned exclusively with the generation of theory rather than the testing thereof; and GTM is using research to develop theory systematically.

A grounded theory is a theory that is inductively derived from the study of the phenomenon it represents. A grounded theory is discovered, developed and provisionally verified through systematic data collection and the analysis of data pertaining to that phenomenon (Strauss and Corbin, 1990: 23). De Búrca and Mc Loughlin (1996: 6) describe it as a general methodology for developing theory that is grounded in data, which have systematically been gathered and analysed.

The building blocks in grounded theory research are the 'seed concepts', often from the researcher's own experiential background. The initial, basic elements of the emerging theory are the 'categories of facts' derived from the data and the 'properties' of each of the categories. The process of developing the theory consists of a series of coding activities, where facts are constantly compared and conceptualised in order to find the underlying structures and linkages. A set of 'relations' binds the categories together into a first theory. The first theory, also called a 'Substantive Theory', is

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initially linked to only the immediate research environment. Strauss and Corbin (1990, 174 –175) state that a Substantive Theory evolves from the study of a phenomenon situated in a particular situational context. This Substantive Theory can subsequently be enhanced and extended into a Formal Theory, by considering an extended research environment. “A *formal theory*, on the other hand, emerges from a study of a phenomenon examined under **many different types of situations.**” (Strauss and Corbin, 1990: 174). Such a ‘Formal Theory’ may eventually link up to a ‘Grand Theory’ (Lehman, 1999: 8).

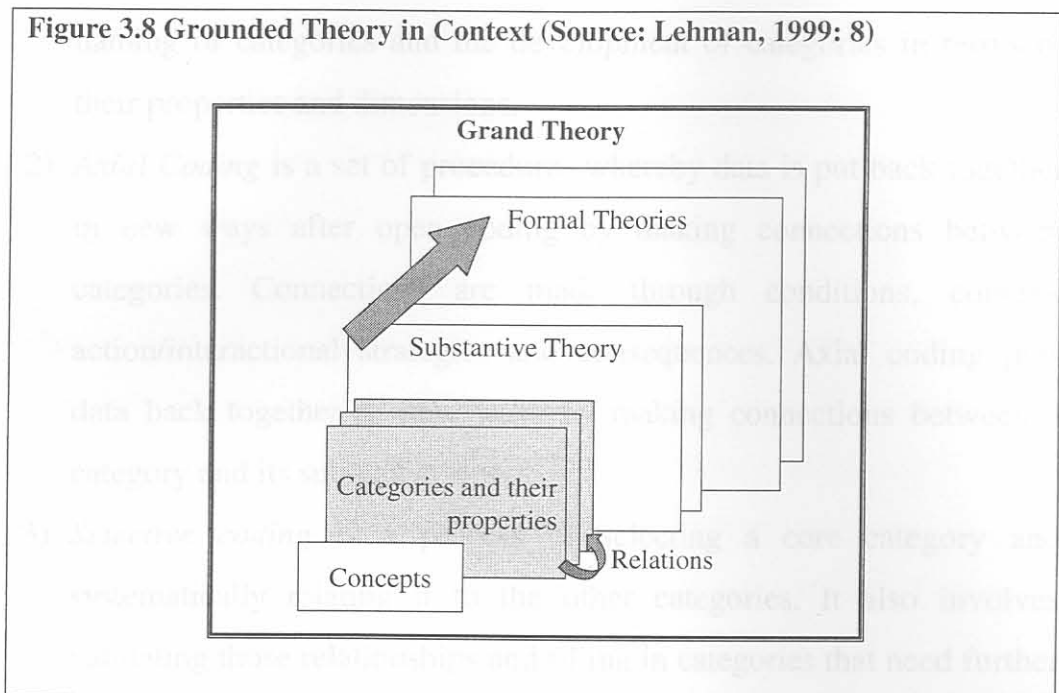
This research aims to establish a Substantive Theory, because it is focusing on a specific phenomenon (i.e., “Why are business managers dissatisfied with explanations of IT value?”) to be found in a particular situational context as indicated by the two Empirical Cases.

The taxonomy of the grounded theory research elements is shown in Figure 3.8.

The taxonomy of the grounded theory research elements is shown in Figure 3.8. Grounded theory approach allows a theory to emerge from data and is thus defined by the data and its situations (De Búrca and Longley, 1996: 7).

Analysis is often done in three main types of coding according to Strauss and Corbin (1998, 271-272). The three types of coding are: open coding, axial coding, and selective coding.

- (1) *Open Coding* is about the naming and categorising of phenomena through close examination of data. Data are broken down into parts, sorted and compared for similarities and differences. Questions are asked about the meanings as reflected in the data. Specific activities include the labelling of data, discovery of categories



Data may be collected in the GTM from interviews, observations or documents, or from a combination of these. Grounded theorists start with a set of experiences they wish to explore. General research questions are begun with, rather than tightly framed pre-conceived hypotheses. In using the grounded theory approach, the problem is allowed to emerge from the data and is thus defined by the actors in the situations (De Búrca and Mc Loughlin, 1996: 6).

Analysis in GTM consists of three major types of coding according to De Vos and Van Zyl (1998: 271-272). The major types of coding are open coding, axial coding and selective coding:

- 1) *Open Coding* is about the naming and categorising of phenomena through close examination of data. Data are broken down into discrete parts, scrutinised and compared for similarities and differences. Questions are asked about the phenomena as reflected in the data. Specific activities include the labeling of data, discovering categories,

- 1) *Open coding* is the process of identifying and naming categories and the development of categories in terms of their properties and dimensions.
- 2) *Axial Coding* is a set of procedures whereby data is put back together in new ways after open coding by making connections between categories. Connections are made through conditions, context, action/interactional strategies and consequences. Axial coding puts data back together in new ways by making connections between a category and its sub-categories.
- 3) *Selective coding* is a process of selecting a core category and systematically relating it to the other categories. It also involves validating those relationships and filling in categories that need further refinement and development.

The effective application of the GTM should produce a grounded theory, i.e., a result that is grounded in and discovered from the data. It must be a theory that has fit and relevance, the theory must work and must be readily modifiable (Smit, 1999: 221; Strauss & Corbin, 1990: 252-258). The detailed action steps required for the application of the GTM are discussed in Chapter 4.

### **18. The research problem is supported by a set of specific questions**

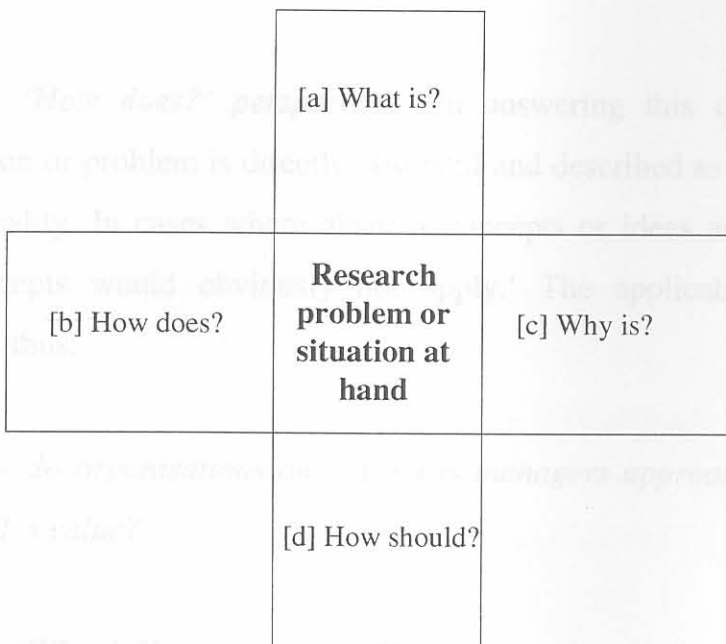
The main purpose for using the GTM is to develop theory or a framework. To do this, a research question(s) is required that will give flexibility and freedom to explore a phenomenon in depth. Grounded theory questions tend to be oriented towards action and process (Strauss and Corbin, 1990: 37-38).



Research projects always start with a problem or issue, usually expressed as a question. Strauss and Corbin (1990: 39) maintain that the research question gets a researcher started and helps to keep the focus throughout the research project.

These research questions typically inquire about the ontological, phenomenological, epistemological and normative nature of the problem or issue at hand (Roode, 1993: 71 - 72). Roode discussed a meta-framework for helping the researcher to pose different questions in order to explore different aspects of the problem or situation at hand. Figure 3.9 shows this meta-framework.

**Figure 3.9: Framework for generic research questions**



Questions in support of the basic research question will now be identified by considering the research problem from the various perspectives contained in Figure 3.9 above (Roode, 1993: 72 - 74).

The basic research questions are:

***From the ‘What is?’ perspective:*** ‘With this question the fundamental nature or essence of the research problem is first explored. The question intends exposing the structure of the problem or the meaning of the underlying concepts or ideas. The purpose is to inquire radically and critically about the problem domain and its accompanying paradigm(s) in order to be able to describe the problem precisely and unambiguously.’ This is underpinned by a fundamental assumption that such universally accepted descriptions for the concepts, ideas and problems do exist. The applicable research question is thus:

*What are the concerns that prompt business managers to inquire about the value of IT?*

***From the ‘How does?’ perspective:*** ‘In answering this question the phenomenon or problem is directly observed and described as it manifests itself in reality. In cases where abstract concepts or ideas are explored, these concepts would obviously not apply.’ The applicable research question is thus:

*How do organisations and business managers approach the issue of IT’s value?*

***From the ‘Why is?’ perspective:*** ‘The purpose of this question is to explain the real-life behavior or characteristics of the phenomenon or problem. In doing so, the focus is on determining relationships between aspects of and/or variables within the problem domain. There is a fundamental assumption underlying this question namely that these

relationships can be used to generalize about the problem domain and causal consequences.’ The applicable research question is thus:

*Why is the concept of IT’s value so problematic for business managers?*

**From the ‘How should?’ perspective:** ‘This question focuses on the conclusions, implications and normative aspects of the research results. It is an evaluation of the results or new insights obtained during the research. In some cases it might lead to prescriptive conclusions regarding the problem domain - in other cases it might enhance the understanding of the problem domain or redefine it.’ The applicable research question is thus:

*How should business managers approach the issue of IT’s value?*

The four basic research questions can be summarised as:

1. What are the concerns that prompt business managers to inquire about the value of IT?
2. How do organisations and business managers approach the issue of IT’s value?
3. Why is the concept of IT’s value so problematic for business managers?
4. How should business managers approach the issue of IT’s value?

The above research questions can each be developed into a number of more specific questions. The development of these more specific questions builds on the literature overview presented in Chapter 2 and in the first part of Chapter 3. The development of further research questions is outlined in Table 3.3 below, questions have been developed by

considering the rationale for the original research questions as well as the applicable perspective from the meta-framework presented in Figure 3.6 above.

**Table 3.3 Further development of the basic research questions**

Basic research question	Rationale for question	Supporting questions
<i>What are the concerns that prompt business managers to inquire about the value of IT?</i>	The question has relevance because an understanding of the reasons why business managers inquire about IT value is required.	<ul style="list-style-type: none"> <li>• What questions do managers ask about IT value?</li> <li>• What events, actions, incidents are triggering these questions?</li> <li>• Under what circumstances are these questions asked?</li> <li>• For what purpose do managers want to use explanations of IT value for?</li> <li>• To whom do managers address their inquiries?</li> </ul>
<i>How do organisations or business managers approach the issue of IT's value?</i>	The purpose of this question is to get a perspective of the methods being used to respond to managers' inquiries about IT value.	<ul style="list-style-type: none"> <li>• How is IT value assessed?</li> <li>• What techniques and methods are being used? What is the rationale for each method?</li> <li>• Where do IT value assessments fit into an</li> </ul>

<b>Table 3.3 Further development of the basic research questions</b>		
<b>Basic research question</b>	<b>Rationale for question</b>	<b>Supporting questions</b>
		organisation's management processes?
<i>Why is the concept of IT's value so problematic for business managers?</i>	This question aims to establish the reasons business managers are finding the IT value concept so problematic.	<ul style="list-style-type: none"> <li>• What are the difficulties business managers have with IT value assessments?</li> <li>• How do these difficulties manifest in practice?</li> <li>• What could be causing these difficulties?</li> </ul>
<i>How should business managers approach the issue of IT's value?</i>	This question explores the findings of the research	<ul style="list-style-type: none"> <li>• How can the intended framework assist business managers in approaching the issue of IT value?</li> </ul>

The above set of questions will guide the application of the GTM, specifically with regard to data collection and data analysis through the GTM coding activities.

### **19. Data will be collected from a variety of sources**

The overall research approach was described previously as an interpretive approach to qualitative research and Grounded Theory was selected as the specific methodology. This is quite significant, because the choice of a research method influences the way in which the researcher collects data.

The research methodology is, in essence, a strategy of inquiry which moves from the underlying philosophical assumptions to research design and data collection (Myers, 1997: 5).

The overall research approach exploits a key feature of the GTM. Data collection and data analysis are done iteratively in grounded theory. As a result, the overall research approach includes the initial development of a preliminary framework. The purpose is to leverage the material and insights gained from the literature overview and, in addition, to enhance the theoretical sensitivity around the issue of IT value. Subsequently further data need to be collected and analysed in order to adjust and refine the preliminary framework into a concluding framework.

Data for the research will be organised into case studies. Myers (1999: 2) mentions that case study research is an example of a qualitative research method. Myers remarks also that observation; interviews and questionnaires; documents and texts; as well as the researcher's impressions and reactions are all sources of qualitative data. The use of case studies is a common qualitative method in IS research. Yin (1994:13) defines a case study as follows:

*“A case study is an empirical inquiry that:*

- *Investigates a contemporary phenomenon within its real-life context, especially when ...*
- *the boundaries between the phenomenon and context are not clearly evident.”*

Mitchell in Smith (1990: 128) gives the following simple definition of the case study: *“the basic descriptive material an observer has assembled by whatever means available about some particular phenomenon or set of*

events.” This definition characterizes a case study as a detailed examination of an event or series of related events that the analyst believes exhibits the operation of some identified general theoretical principle (Smith, 1990: 128). Selecting a case study is determined by its explanatory power. The presentation of the case will, in addition, be limited to that material which most effectively reveals the theoretical principle being investigated (Smith, 1990: 129).

Case studies can use one or more techniques for collecting data. These could include interviews, observational techniques like participant observation and fieldwork, or archival research. Written data sources refer to published and unpublished documents, company reports, memos, letters, reports, e-mail messages, faxes and newspaper articles. Primary and secondary sources of data need to be further distinguished. Primary sources of data are those data which are unpublished and which the researcher has gathered from the people or organization directly. Secondary sources refer to any materials (books, articles etc) that have been previously published (Myers, 1997: 7).

The research data is organised to facilitate the research approach, in other words, to enable the development of a preliminary framework and then to adjust and refine it into a concluding framework. The research data have therefore been structured into three case studies. The research focus, in all three case studies, is primarily on IT at business unit or company level. The perspective is that of a senior business executive or business managers (typically in charge of the business unit or company).

The first case study consists of literature on the topic of ‘IT value’. It will be referred to as the ‘Literature Case’. This case study will be used for the

development of the preliminary framework. Two further case studies will be employed to adjust and refine the preliminary framework. These case studies will consist of empirical information about the topic of IT value in two organisations. The latter case studies will be referred to as ‘Empirical Cases’. The respective case studies will be discussed in more detail in Chapters 4 and 5.

The method of data collection, in order to compile the case studies or cases, is a key activity in the research process. A number of data collection methods are relevant to qualitative research approaches (De Vos and Fouchè, 1998: 90). These data collection methods include:

- Participant observation;
- Interpretation of documents and records;
- In-depth, face-to-face interviews;
- Focus group interviewing; and
- Audio-visual material.

Empirical Case 1 consists primarily of documents and records. Some interviews were also conducted in Empirical Case 1. The purpose of these interviews was to supplement the documentation used in this case study. The primary means of data collection, in Empirical Case 2, is in-depth, face-to-face interviews. Such interviews are regarded as a pipeline for extracting and transmitting information from the interviewee to the interviewer (Schurnik, 1998: 297). In-depth, face-to-face interviews, as a data collection method, will now be briefly examined.

A style of interviewing often employed by qualitative researchers, is termed “in-depth interviewing”. Other terms for this kind of interview include “unstructured interviewing”; “free (attitude) interviewing”;



“conversational interviewing”; narrative interviewing”; “the active interview”; and “the non-directive interview”. The term “in-depth interviewing” will be used. In-depth interviewing can be described as a social interaction between equals in order to obtain research relevant information. The purpose is to understand the interviewee’s life experience or situation as expressed in his own words (Schurnik, 1998: 298 - 299).

In-depth interviews with a “schedule” will be used in both of the empirical cases. The “schedule” refers to a guideline for the interviewer and contains questions and themes that are important to the research. The themes or questions are not meant to be asked in any particular sequence, but rather to ensure that all relevant points are covered (Schurnik, 1998: 298,299).

The research design was covered in this section. In essence the research design comprises an interpretive approach to qualitative research and Grounded Theory is the particular research method. The research data will consist of three case studies (one literature case and two empirical cases). The development of the framework will proceed in two steps. A preliminary framework will be build through the Literature case and a concluding framework will be achieved through the two Empirical cases.

## 20. Conclusion

Chapter 3 dealt firstly with available approaches to the issue of IT value. From the examination of available literature, it would appear that the research question is not yet sufficiently answered. The chapter then proceeds to consider different research approaches and motivate why an interpretive approach to qualitative research is appropriate for the study.

An overview of GTM, as the specific methodology to be used, was dealt with last.

Chapter 4 will deal with the development of a preliminary framework based on the Literature Case. The chapter will describe the application of the GTM coding processes towards the accomplishment of its objective, the preliminary framework. These coding processes, aimed at the analysis, interpretation and synthesis of data contained in the Literature Case, consists of open coding, axial coding and selective coding. Chapter 4 will lastly consider the initial management implications of the preliminary framework.

The overall research approach is depicted in Figure 3.10.

