Applying a Framework for IT Governance in South African Higher Education Institutions

by

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The 19th Century saw the foundations laid for modern corporations; this was the century of the entrepreneur. The 20th Century became the century of management …. The 21st Century promises to be a century of governance, as the focus swings to the legitimacy and the effectiveness of the wielding of power over corporate entities worldwide.

2002 King II Report on Corporate Governance

Chapter 1. Introduction

1.1. Background

Higher Education (HE), through HE Institutions, plays a very important role in society. There is thus a need for this sector to be well managed, especially with regards to planning, organising, and controlling. Corporate Governance has received a lot of attention in recent times, especially to engender trust on the part of the stakeholders. There are many similarities, but also significant differences in the governance of HE institutions and public companies. Information Technology (IT) plays an extremely important role in the modern organisation, creating huge opportunities, but also increasing the risk to the organisation. Therefore, effective governance of IT in HE Institutions is of great importance.

The HE sector is recognized as extremely important to the success of a nation in modern times. In May 2001 Ministers in charge of HE in Europe representing 32 signatories, issued a communiqué particularly stressing that "the quality of higher education and research is and should be an important determinant of Europe's international attractiveness and competitiveness" (European Ministers in charge of Higher Education, 2001, p.3). Access to education can be seen as a basic human right, and education is seen as one of the principal means of promoting peace and respect for human rights and fundamental freedoms generally (UNESCO, 2000, p.5). That good governance in this area of human activity is very important, is illustrated by the fact that it is usually governed at a national level by a government department dedicated to education. In South Africa, the Department of Education (DoE) sets policy at the national level. The official DoE website (http://education.pwv.gov.za/AbouttheDoE/vision.htm, cited 30 January 2004) states

that the vision "is of a South Africa in which all our people have access to lifelong education and training opportunities, which will in turn contribute towards improving the quality of life and building a peaceful, prosperous and democratic society." The vision statement in itself links education with prosperity, quality of life and other desirable characteristics of society.

The subject of corporate governance has received much attention in recent times. One of the reasons is the recent scandals that plagued large institutions worldwide. Examples include the Enron, Worldcom and Xerox and Tyco International scandals (Naidoo, 2002, p.3). Commitment to adhere to certain standards of behavior serves as a basis for trust. Corporate governance is essentially the practice by which companies are managed and controlled. (Naidoo, 2002, p.1). Ramani Naidoo (Naidoo, 2002, p.xiv) quotes Professor Robert Tricker as having said: "If management is about running the business, governance is about seeing that they are run properly. All companies thus require management as well as governance." The work of the King Committee is the definitive standard for corporate governance in South Africa. Many of the guidelines found in the King committee's 1994 report (often referred to as "the Code" or "King I"), became legislation in South Africa (Naidoo, 2002, p.11). The 2002 King Report on Corporate Governance for South Africa (King II) (IoD, 2002b), is the second report of the King Committee on corporate governance. It is designed to bring South African corporate governance in line with international best practices in this regard. In line with international developments, King II places major emphasis on risk management as the ultimate responsibility of the board of directors (Naidoo, 2002, p.11).

Information Technology is an integral part of a modern organisation that must be subject to high standards of governance for a number of reasons. In a modern organisation, there is a strong dependence on IT to deliver critical information to the organisation, and to support business transactions. There is also an increased vulnerability of organisations due to a wide spectrum of cyber threats. Many organisations have made huge investments in IT, and it has become an important resource that should be governed properly. One study conducted in 1995 concluded that the overall success rate of IT projects was only 16.2 percent (Schwalbe, 2002, p.3). Technology has the potential to dramatically change an organisation and its

business practices. Information and information technology have become the most valuable assets in many organisations. (IT Governance Institute, 2000a, p.5).

If then, as mentioned in the previous paragraphs, the HE sector is very important in any country, and HE institutions should follow the guidelines of corporate governance, then it follows that IT governance should be important to HE institutions, because of the high importance of IT in modern institutions.

IT (Information Technology and Information Systems) governance is defined as; "A structure of relationships and processes to direct and control the enterprise in order to achieve the enterprise's goals by adding value while balancing risk versus return over IT and its processes" (IT Governance Institute, 2000a, p.5). IT Governance should be an integral part of the overall corporate governance, just as IT should be an integral part of the enterprise. It consists of the leadership and organisational structures and processes that ensure that the organisation's IT sustains and extends the organisation's strategies and objectives. The purpose of IT governance is to: (i) ensure that IT is aligned with the organisation that it supports; (ii) ensure that IT enables the enterprise to exploit opportunities and maximizes benefits; (iii) ensure that IT resources are used responsibly, and (iv) ensure that IT risks are managed appropriately. (IT Governance Institute, 2003b).

Organisation design revolves around the processes of division of labour into the various tasks that need to be performed, and then the coordination of these tasks to achieve the organisation's goals. Tasks and responsibilities are delimited to achieve efficiency, and governance is required to facilitate the coordination of the different elements (Peterson, 2004, p.61). Traditionally, organisations have relied on hierarchy or vertical organisation and standardization (also referred to as coordination by plan) to achieve coordination. These governance mechanisms remain important, but provide only limited coordination capability. Governance, and in particular IT governance, needs to focus on lateral coordination capabilities (Peterson, 2004, p.62).

In South Africa, public HE institutions are statutory organisations. As such, they are dependant, to a large extent, on taxpayers' money for their operation. This places a responsibility on the institutions to ensure good governance. Although the King II

guidelines apply primarily to listed companies, the King commission recommends that the principles of the report should be used in other institutions.

IT spending constitutes a significant proportion of the total budget in educational institutions. The Department of Education (DoE) is placing pressure on educational institutions to improve efficiency and increase effective utilisation of scarce resources. To quote a white paper on the Department's web site; "The resources allocated to the higher education system have not been put to best use and there is considerable wastage. The higher education system as a whole is both inefficient and ineffective as indicated by high drop-out rates, poor throughput and graduation rates, low research outputs and the under-utilisation of human and physical resources" (Department of Education, 1997)

From birth we find ourselves involved in a great number of social organisations that each claims the right to make and enforce rules that govern the behaviour of its members. Membership to some of these organisations is voluntary, others, such as family and government are not (Raney, 1990, p.27). The rules of some organisations, like government, are more binding than that of others, creating a hierarchy of overlapping governance structures that affect other structures and individuals. The definition of government may be useful in the study of all governance structures. Ranney (1990, p.27) defines government as "the body of people and institutions that make and enforce laws for a society." In this treatise IT governance in HE will be considered as a hierarchy of structures, rules, directives and processes starting with government, through to individual institutions, and then the IT function within that institution. Ranney (1990, p.31) noted that the basic duty of any government is to ensure a nation's survival and welfare, protecting its citizens from enemies outside, and keeping internal conflict from becoming bitter and self-destructive. Some governments, and some forms of government, are better able to perform these basic functions. The basic themes of promoting and ensuring welfare (value creation), protection (risk management) and promoting co-operation (or resolving conflicting interests of different stakeholders) will be explored.

1.2. Problem Statement

HE is very important in South Africa, and hence good governance in this sector is required. How important is IT in HE? If it is of great value, it becomes clear that

guidelines for good IT governance in HE is needed. How good (or bad) is the level of IT governance in South Africa? How can it be measured? Several best practice guidelines or frameworks for IT governance are available worldwide. The problem is to decide which of these, if any, are suitable for implementation in HE institutions in South Africa. What criteria can be used for selecting a suitable framework? How do these frameworks relate to each other, and can more than one standard be adopted with benefit to an institution? These are some of the issues that face top management at HE institutions that will be addressed in this treatise.

1.3. Objectives

The primary objective is to propose suitable IT governance frameworks for use by HE institutions in South Africa.

Secondary objectives include:

- To research and describe the environment in which IT governance operates with reference to the relationships between corporate governance, HE governance and IT governance.
- To demonstrate the need for IT Governance in HE.
- To establish the current level of maturity of IT governance in the HE environment.
- To model the relationship between the most commonly used best practice recommendations and processes with regard to IT governance.
- To identify criteria for the selection of suitable IT governance frameworks for use in HE in South Africa.

1.4. Methodology

A literature survey on the areas of corporate governance, HE governance and IT governance was conducted. The information was analysed and an attempt was made to model various aspects of governance. From this model and associated theory, including existing frameworks for IT governance, appropriate use of best practice frameworks for IT governance in HE in South Africa was argued.

A questionnaire in combination with a capability maturity model was used to determine the state of IT governance in HE in South Africa.

Porter's value chain model was applied to analyse the HE business and to highlight where and how value is created through the use of information and communication technology in HE. Several other business models were identified and used to explain and argue phenomena such as centralised or decentralised control over IT, and organisational structures.

Finally, criteria for the selection of suitable IT governance frameworks were developed, existing frameworks were mapped against the frameworks, and recommendations regarding suitable IT governance frameworks for HE institutions in South Africa were made.

1.5. Layout of Treatise.

The contents of the chapters are briefly discussed below.

Chapter one serves as an introduction and describes the problem area and the objectives for, and the scope of the project. The methodology and the approach that was followed to investigate the problem are presented.

What is corporate governance, and what are the similarities and differences between corporate governance and HE governance? These are the questions that are addressed in chapter two. This chapter describes the environment in which IT governance in HE institutions must function, and contributes to identifying criteria for suitable IT governance frameworks in later chapters.

In chapter three the principles of IT governance are analysed and the relationship between IT governance and corporate governance is established.

A number of IT best practice frameworks are in use worldwide. Chapter four sketches the background and development of IT governance frameworks, including CobiT. The relationship between IT governance and other best practice recommendations such as Standards Organisation's BS7799-1:1999 document (British Standards Organisation, 1999) is modeled. The purpose is to establish whether more than one framework can be used to complement each other, and

whether some frameworks might be more suitable than others under different organizational conditions.

The need and value of IT in HE, and the need for IT governance in HE is established in chapter five. The IT governance maturity model is used in conjunction with a questionnaire to determine the current status of IT governance in South Africa. A set of criteria is developed to select a suitable IT governance framework for use in HE in South Africa.

Chapter six concludes by summarising the most important findings and recommendations. Further research that may be required is identified.

Figure 1.1. is a graphical representation of the chapters and the relationship between them.

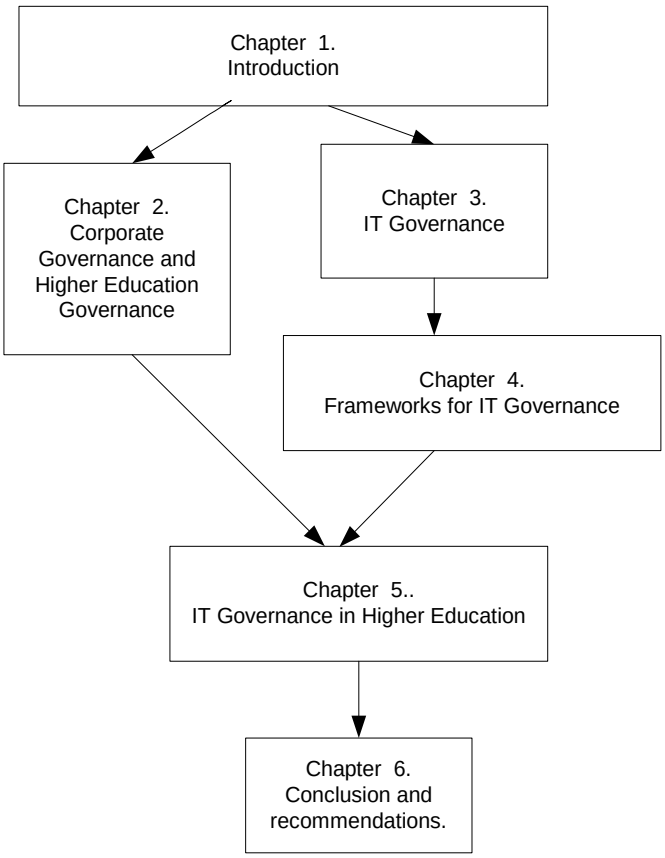

Figure 1.1. A graphical representation of the chapters and the relationship between them.

1.6. Summary.

The purpose of this treatise is to propose a suitable IT governance framework for HE institutions in South Africa. In order to identify a suitable framework, it is necessary to develop criteria for the selection of a suitable IT governance framework. Criteria for selecting a suitable IT governance framework are dependant on the governance structures and the environment in which the IT function must operate. After that, the different best practice standards for IT governance must be examined to identify their key characteristics and how they correspond or differ from each other. Following that, the criteria can be applied to the different frameworks to identify suitable frameworks for implementation in HE in South Africa.

In the next chapter, corporate governance frameworks, and the HE environment in South Africa are analysed. This is appropriate as IT governance is a subset or a component of corporate governance, and the requirements in the broader governance environment will influence the requirements for the IT governance environment.

"Education is the great engine to personal development. It is through education that the daughter of a peasant can become a doctor, that the son of a mine worker can become the head of the mine, that the child of farm workers can become the president of a great nation. It is what we make of what we have, not what we are given, that separates one person from another."

Nelson Mandela – Long Walk to Freedom.

Chapter 2. Corporate Governance and HE Governance

2.1. Introduction

Key questions to answer in governance include: "What is the entity that is being governed?" and "How does the governance system obtain power over it?" (Ragurham, Rajan and Zingales, 2000, p.3). With this in mind, this chapter will focus on corporate governance, followed by HE governance. After a brief introduction and analysis of corporate governance and HE Governance it will be argued that much of the principles of corporate governance also apply to HE governance. IT Governance will be introduced in the next chapter as the ultimate objective of this treatise is to propose a framework suitable for information and communication technology (IT) governance for HE institutions in South Africa.

Significant changes have taken place in the HE landscape in South Africa with regard to the structure and goals and objectives. In March 2001, the DoE published the National Plan for HE, outlining major changes to take place (Ministry of Education, 2001). The National Plan provides targets for the size and shape of the HE system, including overall growth and participation rates, institutional and programme mixes and equity and efficiency goals. This is a clear indication that the government was not satisfied with the way that HE was performing and that better governance was required. Governance is all about seeing to it that these institutions are run properly. In this chapter the structures and control mechanisms used to govern HE will be outlined.

During the last few years there have been a lot of developments in the area of corporate governance (Psaros, J. and Seamer, M., 2002, p.5). This has led to generally accepted good practices in corporate governance. It will be highlighted

that much of the “good practice” or “best practice” policies and procedures that apply to public companies, are very useful for promoting good governance in HE. In this chapter the discipline of corporate governance as well as some of the developments and “best practice” standards in corporate governance is examined to establish communality and principles. The national HE governance structures and legal and policy framework are then examined, as it affects the governance of individual institutions. The governance structures, as found in HE institutions, have elements common to that of corporations, but some unique aspects are described. Finally some conclusions are made regarding the applicability and use of corporate governance principles and practice in HE governance. The question that will be addressed is: What are the differences and similarities between corporate governance and HE governance? This investigation sets the scene for IT governance in HE, which will be discussed in chapter 5.

2.2. Corporate Governance

In this section corporate governance is briefly described. The need for corporate governance is highlighted and the principles and main issues addressed by corporate governance are identified.

2.2.1. What is Corporate Governance?

The Oxford English Dictionary Online (Oxford English dictionary, 2003) defines governance as: “The action or manner of governing” and it includes “Controlling, directing, or regulating influence; control, sway, mastery” and “discreet or virtuous behavior; wise self-command.”

The same work defines management as “Organization, supervision, or direction; the application of skill or care in the manipulation, use, treatment, or control (of a thing or person), or in the conduct of something.” Management may also refer to “A governing body of an organization or business, regarded collectively; the group of employees which administers and controls a business or industry, as opposed to the labour force.” Frenchman Henri Fayall (1841-1925) was the first person to develop a theory of administrative management (McLeod, 1983, p.40). Fayall defined generic management functions as planning, organizing, staffing, directing and controlling as functions that all managers perform to a greater or lesser degree. The

first task is to plan what is to be done. A proper organization structure must be established to implement the plan. The manager must then arrange for staff (and generally resource the organisation) to perform the required functions. The resources must then be directed to perform the required function. Finally the manager must control the activities in order to meet the desired objectives (McLeod, 1983, p.40).

While it is clear that there are much overlap in the concepts of management and governance, the emphasis of governance is on the high-level control aspects of the organisation in relation to its stakeholders, while management is focused on aspects within the organisation. The National Institute of Standards and Technology (NIST), part of the United States Department of Commerce, states that "the term 'governance' refers to the system of management and controls exercised in the stewardship of your organization" (NIST, 2004, p.35). Governance has been referred to as simply the technology of good management (Lange, 2003, p.2).

Corporate governance is essentially the practice by which companies are managed and controlled (Naidoo, 2002, p.1). Ramani Naidoo (Naidoo, 2002, p.xiv) quotes Professor Robert Tricker as having said, "If management is about running the business, governance is about seeing that they are run properly. All companies thus require management as well as governance".

Sir Adrian Cadbury, author of the Cadbury report (Cadbury, 1992), is quoted to have said: "Corporate governance is concerned with holding the balance between economic and social goals and between individual and communal goals…the aim is to align as nearly as possible the interests of individuals, corporations and society" (IoD, 2002b, p.5). Alignment of goals, strategies of the stakeholders with that of the entity that is being governed, is thus one of the basic principles of governance.

The Auditor General of Australia, Pat Barrett, gave the following description of corporate governance in 2000: "Corporate governance is largely about organizational and management performance. Simply put, corporate governance is about how an organisation is managed, its corporate and other structures, its culture, its policies and the ways in which it deals with its various stakeholders. It is concerned with structure and processes for decision-making and with the control and behavior that support effective accountability for performance outcomes/results" (Psaros, J. and Seamer, M., 2002, p.6)

The above-mentioned definitions are fairly vague, and exactly what constitutes corporate governance and where its boundaries lie, are still subjects of debate.

According to Naidoo (Naidoo, 2002, p.1) it encompasses four main areas:

- A system of checks and balances to ensure balanced exercise of power
- A system to ensure compliance with legal and regulatory obligations
- Systems and processes to identify and manage risk to the company
- Practices, which make and keep the company accountable to the broader society in which it operates. Accountability and transparency go hand in hand.

In summary we can say that governance is required to limit the abuse or misuse of power and which is also related to the efficiency and effectiveness of the organisation. In corporate governance the most important issue was initially to manage the power that, in a modern business enterprise, accumulates at the top of the management pyramid. The initial focus of corporate governance was on how to strengthen the rights of outside owners (referring particularly to the shareholders that might be highly dispersed) over management (Raghurham, Rajan and Zingales, 2000, p.1-9; IoD, 2002b, p.8).

2.2.2. Why Corporate Governance?

The subject of corporate governance has received much attention in recent times. One of the reasons is the numerous recent scandals that plagued large institutions worldwide. Examples include the Enron, Worldcom and Xerox and Tyco International scandals (Naidoo, 2002, p.3; Van Esch and Agulhas, 2004, p.5-6). These scandals reflect bad governance.

Judge Mervin King, chairperson of the King Commission, quotes the President of the World Bank, Jim Wolfensohn, as having said that "the proper governance of companies will become as crucial to the world economy as the proper governing of countries" (IoD, 2002b, p.6).

The modern corporate environment has resulted in the division of ownership and control. The company exists as an artificial legal person separate from its shareholders and directors. Even though it has no tangible existence, the company may own assets, trade, incur debts and enforce claims in its favour. The company exists until it is dissolved, despite a change in membership or even the death of all its members (Naidoo, 2002, p.15). It becomes clear that accountability and responsibility must be established to ensure that the company behaves responsibly.

The investment in good corporate governance is financially justified on the basis that: it increases the ability of the institution to attract investment; it increases the ability for sustainable growth; it increases the ability to identify and manage risk. Several studies have indicated that institutional investors are willing to pay a premium of up to 27% for the shares of a well-governed company over one that is poorly governed, even if they have a comparable financial record (Naidoo, 2002, p.4).

The importance of good corporate governance is borne out by the fact that some organisations, such as Eastman Kodak, have now decided to appoint a chief governance officer (CGO) who is a permanent, full-time executive with the power to inculcate best practices in the organization. The CGO at Kodak has responsibilities that cross the IT, finance and legal departments. A CGO's responsibilities should include corporate performance management as well as risk management. The CGO will thus be interested in monitoring the organisation with a view to continuous improvement (Gilbert, Lundy and Leskela, 2003).

At this stage it will be useful to determine whether any corporate governance standards and/or best practices exist and what this entails.

2.2.3. Corporate Governance Standards

Internationally, there has been a lot of development in the area of corporate governance over the last few years. The Organisation for Economic Co-operation and Development (OECD) published the results of a survey of corporate governance developments in OECD countries and they list at least 23 countries that have taken legal measures to tighten aspects of corporate governance in the last two or three years (OECD, 2003, p.24-25). They list some 44 codes that are used by 30 countries.

Some of the most important codes include: the Combined Code from the United Kingdom which includes principles and recommendations from the Cadbury, Greenbury and Hampel; the Corporate Governance rules proposals, in America that was released in April 2003 by NYSE; the "Principles of Good Corporate Governance and Best Practice Recommendations by the Australian Stock Exchanges (ASX) Corporate Governance Council, to name but a few (OECD, 2003, p.24-25). In April of 2004 the OECG issued a revised version of "Principles of Corporate Governance" which emphasizes the oversight responsibilities of boards of directors. These principles have formed the basis for corporate governance initiatives in many countries (Agulhas, 2004, p.5; OECD, 2004, p.9). A few of the most relevant corporate Governance standards are discussed below, with a more detailed discussion of the King Report, as this has a significant impact on corporate governance in South Africa.

2.2.3.1. The Sarbanes-Oxley Act of 2002 (SOA)

The Sarbanes-Oxley act of 2002 (Congress of the United States of America, 2002) was enacted by the American Congress on July 30, 2002. It is considered one of the most critical laws passed in recent years by many analysts (Leech, 2003, p4, p.15-16), including South Africa (Van Esch and Agulhas, 2004, p.5). The law was passed to restore investor confidence and to improve corporate governance after major corporate scandals in America in 2001 and 2002. Section 404 of the SOA directs the Securities and Exchange Commission (SEC) to develop and publish rules to require public companies to report on management's assertions about the effectiveness of internal controls. The SOA does not provide specific guidelines regarding the meaning of effective internal control. The SEC has, however, identified the Committee of Sponsoring Organisations (COSO) internal control framework as one that meets its criteria as guidance in the evaluation and development of controls (Leech, 2003, p.4,15-16). The Act has eleven "Titles" or sections dealing with matters such as auditor independence, corporate responsibility, studies and reports that the act makes compulsory, corporate and criminal fraud accountability and a section on tax returns which requires the chief executive officer of the corporation to sign the tax return (Congress of the United States of America, 2002, p.1-66). What is significant about this law is that it does not merely require senior managers to establish and maintain an internal control structure, but also to assess its

effectiveness on an annual basis and report on deficiencies and material weaknesses (IT Governance Institute, 2004, p.12, 45).

2.2.3.2. Australian Stock Exchange (ASX) Governance Council

The ASX Corporate Governance Council produced a publication called "Principles of Good Corporate Governance and Best Practice Recommendations." This publication is cited because it provides a very simple summary of the essential corporate governance principles which is quoted below (ASX, 2003, p.11):

> A company should:
>
> 1. Lay solid foundations for management and oversight. Recognise and publish the respective roles and responsibilities of board and management.
>
> 2. Structure the board to add value. Have a board of an effective composition, size and commitment to adequately discharge its responsibilities and duties.
>
> 3. Promote ethical and responsible decision-making. Actively promote ethical and responsible decision-making.
>
> 4. Safeguard integrity in financial reporting. Have a structure to independently verify and safeguard the integrity of the company's financial reporting.
>
> 5. Make timely and balanced disclosure. Promote timely and balanced disclosure of all material matters concerning the company.
>
> 6. Respect the rights of shareholders. Respect the rights of shareholders and facilitate the effective exercise of those rights.
>
> 7. Recognise and manage risk. Establish a sound system of risk oversight and management and internal control.
>
> 8. Encourage enhanced performance. Fairly review and actively encourage enhanced board and management effectiveness.
>
> 9. Remunerate fairly and responsibly. Ensure that the level and composition of remuneration is sufficient and reasonable and that its relationship to corporate and individual performance is defined.

10. Recognise the legitimate interests of stakeholders. Recognise legal and other obligations to all legitimate stakeholders.

2.2.3.3. Commonwealth Corporate Governance

The Commonwealth Association for Corporate Governance (CACG) guide on corporate governance is of interest, as the CACG specifically mentions that the principles are applicable to private, public, family- or state-owned enterprises as well as other type of enterprises (CACG, 1999, p.5). They mention specifically that the principles apply to directors, whether executive or non-executive directors. The term director is used to denote any person responsible for the direction of an enterprise (CACG, 1999, p.6), making the guidelines widely applicable. The CACG guidelines are based on 15 principles as outlined below (CACG, 1999, p.6-15):

- Leadership – exercise leadership, enterprise, integrity and judgment in directing the corporation so as to achieve continuing prosperity for the corporation and to act in the best interest of the business enterprise in a manner based on transparency, accountability and responsibility.

- Appointment of directors – ensure that through a managed and effective process board appointments are made that provide a mix of proficient directors, each of whom is able to add value and to bring independent judgment to bear on the decision-making process.

- Strategy and values – determine the corporation's purpose and values, determine the strategy to achieve its purpose and to implement its values in order to ensure that it survives and thrives, and ensure that procedures and practices are in place that protect the corporation's assets and reputation.

- Company performance – monitor and evaluate the implementation of strategies, policies, management performance criteria and business plans.

- Compliance – ensure that the corporation complies with all relevant laws, regulations and codes of best business practice.

- Communication – ensure that the corporation communicates with shareholders and other stakeholders effectively.

- Accountability to shareholders – serve the legitimate interests of the shareholders of the corporation and account to them fully.

- Relationships with stakeholders– identify the corporation's internal and external stakeholders and agree a policy, or policies, determining how the corporation should relate to them.

- Balance of powers – ensure that no one person or a block of persons has unfettered power and that there is an appropriate balance of power and authority on the board which is, inter alia, usually reflected by separating the roles of the chief executive officer and Chairman, and by having a balance between executive and non-executive directors.

- Internal procedures – regularly review processes and procedures to ensure the effectiveness of its internal systems of control, so that its decision-making capability and the accuracy of its reporting and financial results are maintained at a high level at all times.

- Board performance assessment – regularly assess its performance and effectiveness as a whole, and that of the individual directors, including the chief executive officer.

- Management appointment and development – appoint the chief executive officer and at least participate in the appointment of senior management, ensure the motivation and protection of intellectual capital intrinsic to the corporation, ensure that there is adequate training in the corporation for management and employees, and a succession plan for senior management.

- Technology – ensure that all technology and systems used in the corporation are adequate to properly run the business and for it to remain a meaningful competitor.

- Risk management – identify key risk areas and key performance indicators of the business enterprise and monitor these factors.

- Annual review of future solvency – ensure annually that the corporation will continue as a going concern for its next fiscal year.

2.2.3.4. The King Report

The work of the King Committee (the 1994 Code and its 2002 sequel), is the definitive standard for corporate governance in South Africa. Much of the guidelines found in the King committee's 1994 report (often referred to as "the Code" or "King I"), became legislation in South Africa (Naidoo, 2002, p.11). The 2002 King Report on Corporate Governance for South Africa (King II), is the second report of the King Committee on Corporate Governance, and it is designed to bring South African Corporate Governance in line with International best practice. In line with international developments, King II places major emphasis on risk management as the ultimate responsibility of the board of directors (IoD, 2002, p.21). Much of the 1994 King report recommendations has been superseded by subsequent legislation such as the Labour relations Act (NO. 66 OF 1995), basic Conditions of Employment Act (No. 75 of 1995), the Employment Equity Act (No. 55 of 1998) and the National Environmental Act (No. 107 of 1998). Amendments have also been made to the Companies Act (No. 61 of 1973) to include some of the 1994 King Report recommendations. The public Finance Management Act (No. 1 of 1999) brings into force stringent reporting and accountability measures. The Banks Act (No 94 of 1990) enforces higher levels of corporate governance compliance and risk reporting from banking institutions than was required before (IoD, 2002b, p.7).

The King Report advocates an integrated approach to corporate governance that goes beyond the guidelines provided by its counterparts in other parts of the world. It addresses the financial, social, ethical and environmental principles involved in good governance (IoD, 2002, p.6). King notes the move towards the "triple bottom line" reporting, which embraces the economic, environmental and social aspects of the company's activities (IoD, 2002b, p.9). The King Report (IoD 2002b, p.8-9) makes mention of information Technology (IT) "in all its facets" as a "dominant feature" of business since 1994. It mentions IT as a "key driver of business strategy and decisions" and that it has become an "integral part of internal controls and reporting information" (IoD 2002b, p.8).

Some of the fundamental principles of governance identified in the King report are:

- Leadership. The King report states that "corporate governance is essentially about leadership" (IoD, 2002b, p.18). Some of the elements of leadership

specifically mentioned are: (i) leadership for efficiency and effectiveness of the company; (ii) leadership for probity in order to provide assurance that the management of a company will behave honestly and with integrity in regard to their stakeholders; (iii) leadership that is transparent and accountable. "The board must give strategic direction to the company" (IoD, 2002b, p.21).

- Accountability and responsibility. The King report stated that, "one is liable to render an account when one is accountable and one is liable to be called to account when one is responsible" (IoD, 2002, p.5). A Director of a company is accountable to the company by common law and by statute, and responsible to the stakeholders identified by the company. "The modern approach is for the board to identify a company's stakeholders, including its shareholders, and to agree policies as to how the relationship with those stakeholders should be advanced and managed in the interest of the company" (Institute of Directors, 2002, p6). King comes to the conclusion that the stakeholders such as the community in which the company operates, the employees, the customers, the suppliers, and the shareholders must be considered when strategy is formulated.

- The need to balance performance (entrepreneurship) with conformance. Business in emerging economies is driven by entrepreneurs who take business risk and initiatives. The expectation of the shareholders for a reasonable return on their investment must be balanced with the responsibility toward other stakeholders of the organization. King refers to three corporate sins: sloth – a "loss of flair when enterprise gives way to administration; greed – making short term decisions to benefit share options instead of making decisions that will benefit the long term prosperity of the company; fear – where executives "become subservient to investors and ignore the drive for sustainability and enterprise" (IoD, 2002, p.7).

- Monitoring and supervision. The King report promotes self-regulation, but notes that "conformance can be encouraged in various ways" (IoD, 2002b, p.18).

The King Report identifies seven characteristics of good Governance (IoD, 2002b, p.10-11):

- Discipline. Corporate discipline is described as "a commitment by senior management to adhere to behavior that is universally recognized and accepted to be correct and proper."

- Transparency. This term refers to the ease with which an outsider is able to make a meaningful analysis of the company's financial, as well as non-financial, actions. The information must be candid, accurate and timely. The King Commission (IoD, 2002b, p.14, 15) points out that investors now want a forward-looking approach to reporting, and that the balanced scorecard approach to reporting is one form of reporting that allows stakeholders to form an opinion whether the company is likely to have sustained success or not.

- Independence. The term independence is used to refer to "the extent to which mechanisms have been put in place to minimize or avoid potential conflicts of interest, such as the dominance by a strong chief executive or large shareholder." The purpose is so that objective decisions can be made, free from undue influences. The mechanisms include composition of the board, appointment of committees of the board, and the appointment of external parties such as auditors.

- Accountability. Individuals or groups in a company who make decisions and take actions on specific issues need to be accountable for their decisions and actions. Mechanisms must exist and be effective to allow for accountability. These mechanisms must provide investors with the means to assess the actions of the board and its committees.

- Responsibility. With regard to management, responsibility refers to behavior that allows for corrective action and penalising mismanagement. While the board is accountable to the company, it must act responsively to and with responsibility towards all stakeholders of the company.

- Fairness. The rights of various stakeholders must be acknowledged and respected.

- Social responsibility. The King report emphasizes that a well-managed company will be aware of, and respond to, social issues, placing a high priority on ethical standards. Human rights and environmental issues must be dealt with in a responsible, nondiscriminatory manner. Some of the elements of the world view that are valued in the African context include (IoD, 2002b, p.17-18): (i) Spiritual collectiveness, is prized over individualism; (ii) an inclination towards consensus rather than dissention; (iii) humility and helpfulness is more important than criticism of others; (iv) ubuntu (humanity) – based on the premise that you can be respected only because of your cordial co-existence with others; strong belief in the existence of an omniscient, omnipotent creator of mankind. The King Commission is of the opinion that governance in any context should take account of the value system of the society.

After a discussion of principles and other background information, the King Report presents a code of corporate practices and conduct. The code has six sections: (i) Boards and Directors; (ii) Risk management; (iii) Internal Audit; (iv) Integrated sustainability reporting; (iv) Accounting and Auditing; (v) Relations with Shareowners; and communication. Some of the most outstanding points in each of these sections are summarised below.

- **Boards and Directors**. This section is about leadership. The board is the focal point of the corporate governance system and the board is ultimately accountable and responsible for the performance and the affairs of the company. Delegation of responsibility to committees or management does not discharge the board and its directors of their duties and responsibilities. The board must give strategic direction and "must retain full and effective control over the company" (IoD, 2002b, p.21). The board must ensure that the company complies with all laws, regulations and codes applicable. "The board must have unrestricted access to all company information, records, documents and property" (IoD, 2002b, p.21). The board must identify the key risk areas and key performance indicators in the business enterprise. These should be regularly monitored (IoD, 2002b, p.30, 31). There should be a clearly accepted division of responsibilities at the head of the company "to ensure a balance of power, such that no one individual has unfettered powers

of decision-making." The Code places a special responsibility on the company secretary to "provide a central source of guidance and advice to the board, and within the company on matters of ethics and good governance" (IoD, 2002b, p.30).

- **Risk Management**. The Code makes the board responsible for the total process of risk management. Management is accountable to the board for designing, implementing and monitoring the process of risk management. "the board should make use of generally recognized risk management and internal control models and frameworks in order to maintain a sound system of risk management and internal control to provide reasonable assurance regarding" matters including: (i) effectiveness and efficiency of operations; (ii) safeguarding the company's assets (including information); (iii) Compliance with fiduciary requirements; (iv) business sustainability; reliability of reporting; and (v) behaving responsibly towards all stakeholders. The Code highlights the responsibility of the board to ensure that a comprehensive risk assessment is annually undertaken. Risk management should be addressed by a special board committee, but should be practiced by all staff. "Whistleblowing" should be facilitated.

- **Internal Audit**. Internal audit is described as "an independent, objective assurance and consulting activity to add value and improve a company's operations" (IoD 2002b, p.34). The head of the internal audit should report to the chief executive officer. There should be a clear segregation between internal and external audit to ensure that independence is not impaired. The internal audit function should co-ordinate with internal and external providers of assurance to ensure proper controls are in place, and to minimize duplication of efforts.

- **Integrated sustainability reporting**. The thrust of this section is that the company should report on matters that are of value to the stakeholders of the company. The company should report on what business principles, codes or standards it has adopted, and on the extent to which they have been implemented. Reports should be clear, reliable, relevant, comparable, timely

and verifiable. Every company should have a code of ethics and should report on compliance with the code.

- **Accounting and Auditing**. The board should appoint an audit committee that has a majority of independent non-executive directors. External auditors must be appointed by the board. The auditors must "observe the highest level of business and professional ethics" and their independence must not be impaired in any way.

- **Relations with Shareholders**. Shareholders should be provided with relevant information, and where contentious issues are under consideration, polls of shareholder opinion could be undertaken.

- **Communication**. This section of the code deals with communication with stakeholders. The concepts of "substance over form" and openness in reporting is encouraged. The directors should prepare an annual report that makes specific statements relating to the fairness, adequacy and effectiveness of the reports, internal controls and risk management processes in the organization.

In summary it can be said that the King report on corporate governance is of relevance to many institutions in South Africa, not only public companies. The report clarifies the fact that the needs of the stakeholders must be addressed. The shareholders can reasonably expect to see value for their investment. They want to be assured that risks are adequately addressed and that matters are managed in an ethical manner, complying with statutory requirements. This implies clear responsibilities and accountability. The board, as representatives of the owners, must have sufficient information regarding the performance of the corporation. This implies measurement of performance and transparent reporting.

2.2.4. Conclusion - Corporate Governance

From an examination of the above mentioned codes a few recurring themes can be identified. These themes include: (i) The board (representing the investors and stakeholders) has the responsibility to ensure that the investors get value for their investment. (ii) The board must exercise leadership, enterprise, integrity in directing the corporation. (iii) The board is responsible to manage the risk to the corporation.

(iv) Value for stakeholders means more than a financial return. The responsibility of the governing body is to ensure that the business strategy is aligned with the goals and values of the shareholders, also considering the other stakeholders. (v) Risk and compliance is addresses through embedding responsibility and accountability structures. (vi) Both value and risk management requires measurement and clear reporting.

King (IoD, 2002b, p.14) noted that the four primary "pillars of fairness, accountability, responsibility and transparency, are fundamental" to many international guidelines of corporate governance.

A brief review of the above mentioned standards confirms the conclusion that the emphasis of best practice on how boards function have long been on structure, composition, size and independence. In recent times more emphasis is placed on risk management, which includes the risk associated with IT services and processes (IT Governance Institute, 2001, p.7).

In the next section the governance of public HE as a sector, and then at the institutional level will be explored.

2.3. Higher Education Governance

In this section, governance is described in the context of HE. Subsequently the importance of governance in HE in a South African context will be established, followed by the structures and principles that have been established in HE governance in South Africa. This is done to enable a comparison between corporate governance and HE governance.

In the glossary of the National Institute of Standards and Technology's document "Education Criteria for Performance Excellence", the term "governance" in the context of education in the United States of America is described as follows: "The term governance refers to the system of management and controls exercised in the stewardship of your organization. It includes the responsibilities of your governing body, e.g., board of education board of trustees/overseers, and the senior leaders of your organization; in some private education institutions, it may also include owners/shareholders." They continue to mention that a combination of federal, state, and municipal regulations, charters, by-laws, and policies documents the rights and

responsibilities of each of the parties. They mention that organization is directed and controlled to ensure (1) accountability to stakeholders, (2) transparency of operations, and (3) fair treatment of all stakeholders. Governance processes that are identified include: (i) approving strategic direction, (ii) creating and enforcing policy (iii) monitoring and evaluating senior manager's performance (iv) financial auditing, and (v) managing risk. Effective governance is important because it promotes trust and effectiveness (NIST, 2004, p.35). This description of governance in HE is adequate and extensive enough to provide a clear understanding when reference is made to governance in HE in the remainder of this document.

2.3.1. The importance of Higher Education in South Africa

It can reasonably be assumed that the more important a resource, the greater the requirement to wisely govern the resource. The importance of HE is borne out by the references in the following paragraphs.

"Education is not only pivotal to economic prosperity but it also plays a crucial role in enabling South Africans to improve the quality of their lives and contribute to a peaceful, productive and democratic nation" (South Africa, 2003, p.189).

"The important strategic role that universities can play in helping nations to meet public goals has been extensively recognized" (Conceicao and Heitor, 2001, p.1)

The Bill of Rights contained in the Constitution of the Republic of South Africa, 1996 (Act 108 of 1996), section 29 states: "Everyone has the right (a) to a basic education, including adult basic education; and (b) to further education, which the state, through reasonable measures, must make progressively available and accessible." It can be argued that HE in South Africa thus becomes a fundamental right.

The government regards education as one of the most important long-term investments a country can make. There has been a significant increase in the education budget allocation, from R31,8 billion in 1994 to R59,8 billion in 2002. This is almost 6% of gross domestic product, making the South African government one of the highest investors in education in the world (South African Treasury, 2003, p.189).

Therefore, education and also HE can be regarded as very important and should be governed wisely.

2.3.2. Governance of Higher Education Institutions

Governance of the HE sector, including individual HE Institutions, starts at the highest level of government, the National Government, with due regard for its stakeholders. This makes governance of HE Institutions much more complex than governance of corporations.

The matter of governance of HE Institutions has become a matter of increasing concern in recent times. At the beginning of 2001, the Council on Higher Education (CHE), a statutory body in South Africa, established a task team on governance at HE institutions. The Minister of Education requested the CHE to advise him on governance in HE institutions. One of the conclusions of the CHE task team was that "good governance is, and will be, a critical and vital element for successful transformation" (CHE, 2002, p5). Transformation of HE in South Africa was given impetus when the Department of Education (DoE) announced a national plan for restructuring HE in South Africa in 2001 (Department of Education, 2001). The plan calls for the integration or incorporation of several institutions, reducing the number of HE Institutions from 36 to 27. One of the reasons for this step is to improve the governance of these institutions

Governance of HE institutions is prescribed in the Higher Education Act (Act no 101 of 1997). The scope and purpose of the act is stated in the Government Gazette (South Africa, 1997, p.1) and it includes: (i) To regulate HE; (ii) to provide for the establishment, composition and functions of a Council on Higher Education; (iii) to provide for the establishment, governance and funding of public HE institutions; (iv) to provide for the appointment and functions of an independent assessor; and (iv) to provide for quality assurance and quality promotion in HE (South Africa, 1997, p.1). Through legislation and by funding and subsidizing public HE institutions and individual students, the government has a high degree of control over the HE sector (Department of Education, 2004, p.2; Hall and Symes, 2003, p.14). The Council for Higher Education (CHE) mentions funding, planning and quality assurance as the three key levers for steering HE in South Africa (CHE, 2003, p.i).

The official South African Yearbook 2002/03 provides an excellent summary of the state of education in South Africa (South Africa, 2003, p.189-208). The education system and it's governance is described in relation to its structures, then according to the policy and legislative framework, and finally the major plans for the future as far as the HE institutional landscape is concerned.

2.3.2.1. Education structures

South Africa has a single national education system, which is organised and managed by the national Department of Education and the nine provincial departments.

Ministry of Education

The National Education Policy Act, 1996 (South Africa, 1996) gives the Minister of Education the power to determine national norms and standards for education planning, provision, governance, monitoring and evaluation. The principle of democratic decision-making must be exercised within the context of the overall policy goals. In determining policy, the Minister must take into account any provincial law relating to education. South Africa has a system of "state steering", where the Minister of Education has a responsibility to direct the HE system in the national interest, and to respect the autonomy of the individual institutions (CHE, 2002, p8). The Ministry of Education has direct control over government grants to public HE institutions. These grants can be between 35% and 65% of the total income of the institutions (Ministry of Education, 2004, p.2). The relationship between the state and HE since 1997 is described as co-operative governance. In recent times it has been argued that the model is not sufficiently robust, and that HE institutions should receive more autonomy, in a relationship that can better be described as "conditional autonomy" (Hall and Symes, 2003, p.5).

National and provincial departments of education

The role of the DoE is to translate the education and training policies of government and the provisions of the Constitution into a national education policy and legislative framework. HE Institutions fall under the jurisdiction of National Government, and not under the provincial departments.

The core activities of the Department are to provide policy, provide standards and to monitor the implementation of policy, i.e. governance of the education system, including the HE education environment.

Statutory bodies

The DoE governs the HE sector through several statutory bodies including the Council of Education Ministers (CEM), the Heads of Education Departments Committee (HEDCOM), the South African Qualifications Authority (SAQA), the Council on Higher Education (CHE) and the National Student Financial Aid Scheme (NSFAS). These are briefly described below.

- **Council of Education Ministers (CEM)**

  The CEM, consisting of the Minister of Education, the Deputy Minister of Education and the nine provincial executive council members (MECs) for education, meets regularly to discuss the promotion of national education policy, share information and views on all aspects of education in South Africa and co-ordinate action on matters of mutual interest.

- **Heads of Education Departments Committee (HEDCOM)**

  HEDCOM consists of the Director-General of the Department of Education, the Deputy Directors-general of the Department, and the heads of provincial education departments. The functions of the Committee include facilitating the development of a national education system, sharing information and views on national education, co-coordinating administrative action on matters of mutual interest and advising the Department on a range of specified matters relating to the proper functioning of the national education system.

- **South African Qualifications Authority (SAQA)**

  SAQA is a statutory body, which was established in 1995 and is answerable to the Ministers of Education and of Labour. The South African Qualifications Authority Act (No 58 of 1995), requires SAQA to accredit bodies responsible for monitoring and auditing the provision and achievement of NQF registered standards and qualifications. These bodies are called Education and Training

Quality Assurance bodies (ETQAs). The SAQA Act and the ETQA Regulations, 1998 (South Africa, 1998) provide the enabling and regulatory framework for implementation of the quality assurance systems and processes required by the NQF. The ETQA activities are monitored by SAQA to determine compliance with SAQA requirements. They in turn are responsible for the accreditation of education and training providers such as public HE institutions.

- **Council on Higher Education (CHE)**

The Higher Education Act (Act No 101 of 1997) makes provision for the establishment, composition and functions of a Council on Higher Education (CHE) .The CHE is responsible for advising the Minister on all aspects of HE, in particular funding arrangements, language policy and the appropriate shape and size of the system (South Africa, 1996, Chapter1-2).

The Higher Education Act also holds the CHE responsible for designing and implementing a system for quality assurance in HE. It promotes student access to HE, publishes an annual report on the state thereof and convenes an annual summit for stakeholders. The Council also holds executive responsibility for quality assurance through its permanent subcommittee, the Higher Education Quality Committee (HEQC).

The HEQC of the CHE has statutory responsibility to conduct institutional audits as indicated in the Higher Education Act of 1997. Audits are the responsibility of the HEQC also in terms of being recognised by SAQA as the ETQA for the HE band (South Africa, 2003, p.189-208).

- **National Student Financial Aid Scheme (NSFAS)**

The NSFAS is constituted and regulated by the National Student Financial Aid Scheme Act number 56 of 1999 (South Africa, 1999). The purpose of the Act is to "establish the National Student Financial Aid Scheme (NSFAS); to provide for the management, governance and administration of the NSFAS; to provide for the granting of loans and bursaries to eligible students at public HE institutions and for the administration of such loans and bursaries; to provide for the recovery of loans; to provide for the repeal of the Provision of Special Funds for Tertiary Education and Training Act, 1993; and to provide for matters connected

therewith." By controlling funding to students, the Department of Education is able to influence access to HE institutions.

Good governance requires structures with clear goals and responsibilities. The structures used to govern the HE sector were briefly described above. The role of monitoring and reporting was highlighted through structures such as the SAQA and the associated ETQAs. It is now appropriate to examine the education policy framework.

2.3.2.2. Higher Education Policy

Governance in HE is exercised through statutory organizational structures as discussed in the previous section. An important element of governance is the formulation of policies and procedures. Policy at a national level can take the form of legislation, and legislation pertaining to HE in South Africa is briefly outlined below.

Legislative framework

Suomi and Tahkapaa (2004, p.360,370) refer to legislation as obligatory governance structures. Compliance to legislation is not optional for HE institutions. Education policy is based on the following legislation:

- The National Education Policy Act, 1996 (South Africa, 1996) is designed to identify the policy, legislative and monitoring responsibilities of the Minister of Education, and to formalise relations between national and provincial authorities. It established the CEM and HEDCOM as intergovernmental forums to determine national policies in general.

- The HE Act, 1997 (South Africa, 1997) makes provision for a unified and nationally planned system of HE and creates the statutory CHE, which advises the Minister and is responsible for quality assurance and promotion. This act specifies policies, structures and processes that govern the HE sector.

- The SAQA Act, 1995 (South Africa, 1996) provides for the creation of the NQF, which establishes the framework for a national learning system that integrates education and training at all levels.

2.3.2.3. Higher Education Institutions

Universities and technikons (now referred to as universities of technology) in South Africa are autonomous institutions, meaning that their respective councils are fully responsible for their governance. The Government does not prescribe the conditions of service for educators at universities or technikons. Private Acts of Parliament establish universities and technikons, which administer their own affairs within the governance framework defined by the legislation and structures outlined in the previous section.

The function of an HE Institution must be aligned with the purpose, strategy and long term plans of the DoE. For this reason it is important to recognize the strategic vision of the DoE when governance of the individual institutions is considered. The DoE sees the role of HE in the South African education system as three-fold according to the South African Yearbook (South Africa, 2003a, p.220):

- Human resource development: the mobilisation of human talent and potential through lifelong learning to contribute to the social, economic, cultural and intellectual life of a rapidly changing society.

- High-level skills training: the training and provision of person power to strengthen the country's enterprises, services and infrastructure. This requires the development of professionals with globally equivalent skills, but who are socially responsible and conscious of their role in contributing to the national development effort and social transformation.

- Production, acquisition and application of new knowledge: national growth and competitiveness are dependent on continuous technological improvement and innovation, driven by a well-organised, vibrant research and development system, which integrates the research and training capacity of HE with the needs of industry and of social reconstruction.

The objectives as outlined above are aligned with the UNESCO “World Declaration on Higher Education” (UNESCO, 2000, p.72).

From the above it becomes clear how the HE sector is governed through legislation, policies, organisation structures and plans at a national level and international level.

The DoE is thus one of the most important stakeholders for any individual HE Institution. The Department recognizes that government alone cannot build a high quality education sector. It depends on partnerships between public sector, civil society and international partners (South Africa, 2003a, p.225).

2.4. Governance of an HE Institution.

Having discussed the governance structures, policy and legislative framework within which an individual HE institution functions, it is now appropriate to explore the governance structures and framework of individual HE institutions such as technikons and universities.

2.4.1. Governance Structures of an HE Institution

HE institutions in South Africa have a bi-cameral governance structure with shared accountability (CHE, 2002, p.7). The Higher Education Act, 1977 (no 101 of 1997) section 26-28 prescribes the following governance structures and offices:

- **A council**. The composition of the council is prescribed by this law and must include the principal, the vice-principal(s), persons appointed by the Minister, members of senate, academic employees, students and other employees. The registrar of the HE institution must be the secretary to the council. In line with the 2000 King Report recommendation that the board should "exercise objective judgment on the corporate affairs of the company, independent of management" (Naidoo, 2002, p.55), the Act determines that the chairman of the board may not be the principal, a student, or employee of the HE Institution. Furthermore, at least 60% of the members of the council must be persons who are not employed by, or students of the institution concerned.

- **A senate**. The senate is accountable to the council for the academic and research functions of the HE Institution. Membership must consist of the principal and vice-principal(s) as well as representatives from the council, academic and non-academic employees, and members of the students' representative council. The majority of the members must be academic employees of the HE Institution concerned. Academic employees are appointed by council after consultation with senate.

- **A principal**. The principal is responsible for the management and administration of the institution.

- **A vice-principal**. The specific functions of the vice-principal are not specifically given, but it can be presumed that it would be good practice to require such a position for the sake of business continuity.

- **A students' representative council**. The establishment, functions, composition, manner of election and privileges of this body must be determined by the institutional statute and the institutional rules.

- **An institutional forum**. The institutional forum must advise the council on issues affecting the institution such as policies, codes of conduct, dispute resolution procedures and creating an appropriate environment for teaching and learning.

- Such **other structures** and offices as may be determined by the institutional statute. The Act makes it clear that "the council and the senate are not divested of responsibility for the performance of any function delegated or assigned to a committee." The functions, composition, manner of election, procedure at meetings may be determined by the institutional statute, institutional rules or an Act of Parliament (Section 29 of the HE Act of 1997).

2.4.2. HE Institution Policies and Procedures

The HE Act no 101 of 97 (South Africa, 1997) authorizes the council of an HE institution to make institutional statutes in respect of matters not expressly prescribed by law to promote the effective management of the institution. Any institutional statue must be approved by the Minister of Education. The Minister is required to make a standard institutional statute, which applies to every public HE institution until such time as the council of the relevant institution makes its own statute.

Disciplinary measures and procedures, admission requirements, the composition of senate and the students' representative council are matters that must be addressed by institutional statutes.

In addition to these matters prescribed by the law, HE institutions have policies and procedures relating to finance, procurement, human resource management, information technology and other matters, much as would be found in any public company.

It is of interest what matters receive attention of HE institution boards. In a report of the HE governance task ream of the CHE, the observation is made that the governance debate has turned to "one about the implications, benefits and outcomes for higher education for society at large." They note that the key objective of the new debates is to "ensure the efficiency of institutions to deliver with regards to teaching and research output" (CHE, 2002, p.1).

2.4.3. HE Reporting and Monitoring

The HE Act mandates the council of an HE institution to keep records of all its proceedings and to keep "complete accounting records of all assets, liabilities, income and expenses and any other financial transactions of the public higher education institution as a whole, of its substructures, and of other bodies operating under its auspices." The council is further required to provide the Minister of Education with an annual report on the overall governance of the HE institution, along with duly audited financial statements. The Minister may require additional information and in such a format as the Ministry may reasonably require.

The HE institution is obligated by the HE Act to provide the Minister of Education with the information required by the Reporting by public Entities Act No 93 of 1992.

2.4.4. Conclusions on HE Governance

From this brief overview of HE governance it can be argued that the National Government considers the governance of HE institutions as important enough to embed some of the governance structures and principles in legislation. Some of the elements of governance, the allocation of responsibilities to structures, the formulation of policies and procedures and some of the performance measurement mechanisms were identified.

2.5. Standards in use by Higher Education

From the brief overview of HE governance, it can be noted that governance standards are often embedded in legislation. From the overview of corporate governance, it was also noted that some corporate governance standards are in the form of legislation, while other standards are voluntary, or pre-requisites for membership to certain stock exchanges. It is appropriate at this stage to consider whether any international standards exist in the HE governance area.

2.5.1. European Network of Quality Assurance in Higher Education (ENQA)

In 2001 European Ministers in charge of HE in 32 countries met in Prague. At this meeting they re-affirmed their objective of establishing a European Higher Education Area by 2010. To achieve this objective the Ministers of Education emphasized the need for a credit system. The purpose is that course units, degrees and other awards achieved in one institution, can be recognized in another institution in order to facilitate transferability and accumulation of learning experiences. At this meeting, Ministers called on HE institutions, national agencies and ENQA to collaborate in establishing a common framework of reference and to disseminate best practice (European Ministers in charge of Higher Education, 2001, p.1-4).

The European quality management framework is based on the following values and concepts: (i) leadership, (ii) policy and strategy, (iii) people management, (iv) resources, (v) processes, (vi) customer satisfaction, (vii) people satisfaction, (viii) impact on society and (ix) business results. The framework has a strong focus on self-assessment, a comprehensive, systematic and regular review of the organisation's processes. The framework is based on Total Quality Management (TQM) principles, but also includes a set of criteria that have become widely accepted across Europe (SAQA, 2001, p.8-14; Izadi, Kashef and Stadt, 1986, 60-76). The benefits of the control self-assessment (CSA) approach in audits include: (i) enhanced auditor understanding of the client's business; (ii) more accurate assessment of the inherent and control risks; (iii) reduced risk of audit failure (Engle and Gilbert, 2001, p.46-47). The values and concepts of the European quality management framework are very similar to that of the Malcolm Baldrige framework, which is discussed in the following heading.

2.5.2. Malcolm Baldrige Framework - USA

The US Department of Commerce is responsible for the Baldrige National Quality program. The National Institution of Standards and Technology (NIST) is the agency within the Department of Commerce responsible for managing the Baldrige program. The American Society for Quality (ASQ) administers the Baldrige award program under contract to NIST. The Baldrige framework assists educational institutions in the process of self-assessment by identifying seven dimensions of organisational functioning that are critical in HE: leadership, strategic planning, external focus, information and analysis, faculty/staff focus, process effectiveness and outcomes and achievements (NIST, 2004, p.15-29). According to Harry S. Hertz, Director of the Baldrige National Quality Program, the framework can help organizations to respond to challenges "to create value for students, stakeholders, and the organization; openness and transparency in governance and ethics; and the challenges of rapid innovation and capitalizing on knowledge assets" and to "align resources and approaches, improve communication, productivity and effectiveness, and achieve strategic goals" (NIST, 2004, p.i).

The NIST uses the following graphic in figure 2.1. to depict the systems perspective of the Baldrige framework (NIST, 2004, p.5):

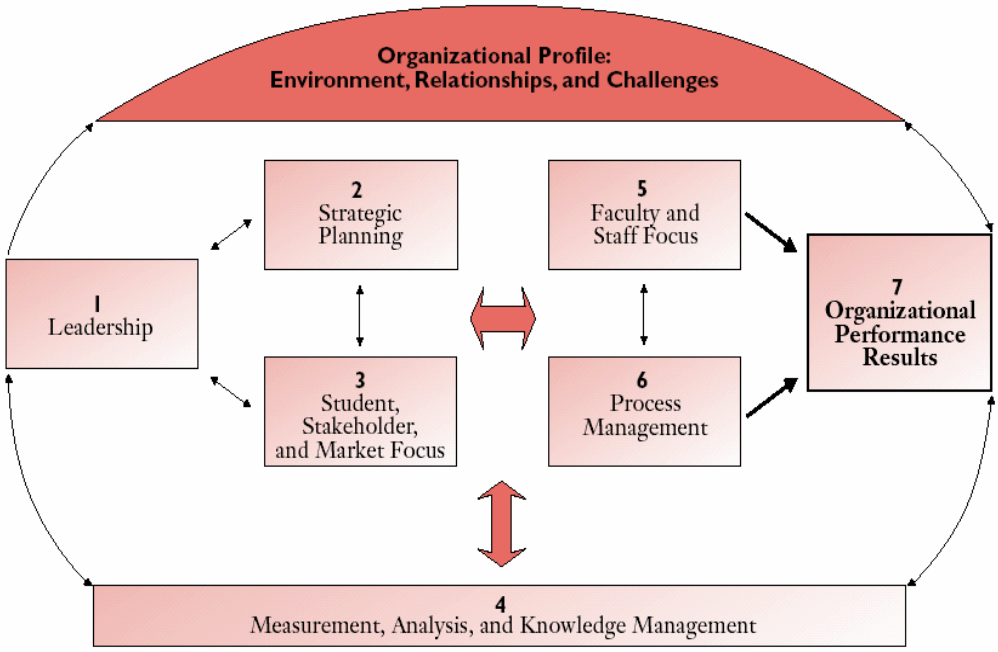

Figure 2.1. Baldrige Education Criteria for Performance Excellence Framework: A systems perspective (NIST, 2004, p.5).

In their model, Leadership, strategic planning and student, stakeholder, and market focus represent the leadership triad. Senior leadership has the responsibility to set organisational direction and seek future opportunities for the organization. Faculty and staff focus, process management and organisational performance results represent the results triad. The staff and key processes accomplish the work that yield performance results related to "faculty and staff, governance and social responsibility" (NIST, 2004, p.6). "Results should be used to create and balance value for …. key stakeholders" (NIST, 2004, p.5). Measurement, analysis and knowledge management is seen as "critical" to the effective management of the organization and is seen as the foundation for the performance management system (NIST, 2004, p.6).

2.5.3. The ISO 9000/2000 International Code of Practice for Quality Management Systems

The focus of this international standard is to improve processes of an organization in order to enhance effectiveness and efficiency. The standard does not promote uniformity of quality management systems, but is adaptable to the size, structure market and resources of the organization. The focus of the standard is on identifying and meeting the needs and expectations of the stakeholders (customers, employees, suppliers, owners and society), and to do this in an efficient and effective manner. The goal is to achieve, maintain and improve overall organizational performance and capabilities (SAQA, 2001, p.12-13). The ISO 9000 standards are used in a number of countries in HE Institutions.

2.5.4. SAQA Criteria for Education and Training providers.

The SAQA Act of 1995 (South Africa, 1996) assigns SAQA the responsibility to enhance quality in education and training. In a document entitled "Quality Management Systems for Education and Training Providers", SAQA (SAQA, 2001, p.21) lists eight core criteria for education and training providers. Figure 2.2. is an extract from that document.

Criterion	Elaboration
1. Policy Statement	The organisation's aims, objectives and purposes must be spelt out.
2. Quality management systems	Identify processes and outline procedures that implement quality management in the organisation.
3. Review mechanisms	Outline the ways in which the implementation of policies would be monitored.
4. Programme delivery	Outline how learning programmes would be developed, delivered and evaluated.
5. Staff policies	Outline policies and procedures for staff selection, appraisal and development.
6. Learner policies	Policies and procedures for the selection of learners are outlined, and learners are given guidance and support.
7. Assessment policies	Outline policies and procedures for forms of assessments that are used and how they are managed.
8. Management system and policies	Indicate the financial, administrative and physical structures and resources of the organisation, as well as procedures of accountability within the organisation.

Figure 2.2. Core Criteria for Education and Training Providers (SAQA, 2001, p.20).

2.5.5. Conclusion HE governance frameworks

The frameworks identified above have as its emphasis quality assurance in HE. Regulation R1127, under the SAQA act, defines quality as "the combination of processes used to ensure that the degree of excellence specified is achieved" (South Africa, 1996). The approach in all these standards is based on process improvement. The assessment process entails the identification and setting of objectives, the focus on the stakeholders, measurement of the results in relationship to the objectives, and identification of actions to be taken to improve the processes involved. In this regard, quality management frameworks are remarkably similar to governance frameworks.

SAQA reviewed the debates in quality management and assurance and they found two dominant approaches: the Total Quality Management (TQM) approach and the Conformance to Specification (CTS) approach. They found that most quality assurance systems, in fact, were hybrid systems, containing elements of both approaches. SAQA asserts that the TQM approach focuses on the process of quality development rather than the tools or specifications. The CTS approach consists of a set of clearly defined characteristics and a basic set of elements for developing a quality management system (SAQA, 2001, p.15-17). It can then be argued that, in like manner, the processes of governance in HE and corporate governance will show great similarities, while the actual specifications will differ more in the different environments.

2.6. A comparison between Corporate Governance and HE Governance.

In previous sections, observations of corporate governance and HE governance were made. The question whether the principles of corporate governance find application in HE governance can now be addressed. Some similarities and difference between corporate governance and HE governance may be noted:

- King identifies seven primary characteristics of good governance: Discipline, transparency, independence, accountability, responsibility, fairness, and social responsibility (IoD, 2002b, p.10-11). It can be argued that these principles apply with equal force to the governance of public companies and

to HE institutions. Board independence is specified in the HE Act, as section 27 of the Act requires that least 60 percent of the members of the board must not be employees or students of the institution (South Africa, 1997, p.45).

- The focus of corporate governance is on an effective, efficient and sustainable business and that the interest of the shareholders is met. Value generated by a public corporation is measured primarily in financial terms. In the case of an HE institution, what is of value to the stakeholders is that the functions of education and research are performed effectively and efficiently. HE governance is concerned about effective and efficient delivery of HE services in national interest. In both cases the institutions are governed on behalf of external "owners" to deliver value.

- In the case of public companies, the role of the government is to serve in the national interest by providing economic stable conditions and to create a legal basis for fair trade. In HE the government plays a "steering" role through legislation and statutory bodies. The government is thus more directly involved in the governance of HE institutions.

- The governance task team of the CHE concluded that "an unacceptably high percentage of councils are either in a condition of crisis which has gridlocked procedures, or exhibit symptoms that indicate that crises could develop" (CHE, 2002, p.9). Some components of the King commission report have been taken into legislation, but compliance with the recommendations in the report are largely voluntary, and many South African public companies have a long way to go in order to comply with all the recommendations.

- The principle of an independent and well-informed council that must serve the stakeholders is well established in corporate governance and in HE governance. Several of the corporate governance codes emphasize the need for the board to have access to timely and accurate information.

- The important role and responsibility of the governing structures to manage threats to the institution under their control is well established. Executives and boards can be held accountable for the security of their organizations.

Council may appoint committees or individuals to perform any of their functions, but remain responsible for the institution under its control.

- Boards/Councils are accountable to their stakeholders and for reporting to Government. Boards and councils are obliged to report on financial and non-financial matters, often in a prescribed manner.

- The importance of assurance through independent auditing, accreditation and transparent reporting to stakeholders is well established. In addition to requiring an annual independent audit of the finances of an HE institution, the HE Act calls for the creation of structures and mechanisms to audit the quality of education and research of the individual institutions.

- Unlike their counterparts on the board of public companies, council members of HE institutions do not receive financial compensation for their services.

- The single board structure of public companies differs somewhat from the bi-cameral governance structure of council and senate in HE institutions. This difference should be considered when IT governance in HE institutions is examined.

From the above the conclusion can be made that corporate governance and HE governance have a great deal in common. Conceicao and Heiter (2001, p.1) said that "it can be argued that a trend is emerging leading to a breakdown of the institutional boundaries that separated companies and universities." They argue that this "institutional convergence" is as a result of two forces. The first force results from the fact that the creation of added value and wealth is increasingly associated with the production of knowledge. The second force is that HE institutions are finding it more difficult to find sufficient funds for their basic tasks of teaching and research, so they are increasingly looking at companies to learn how to derive commercial benefits from their intellectual assets and endeavors.

It can be argued that the principles of good governance can be applied in significantly different organisational environments. The need to provide direction with a view to create value for the stakeholders, balancing multiple objectives, is common to different types of institutions. The need to monitor and control with a

view to improving effectiveness and efficiency is common to different organization types. The need to manage risk while creating value is common to different organization types.

The Baldrige Education Criteria framework is built on the Baldrige Business Sector Criteria framework. The NIST explains that the rationale for the use of the same framework is that it is adaptable to the requirements of all organizations, including education organizations. They explain that the adaptation of the framework for the education sector is largely a translation of the language and basic concepts of business excellence to similarly important concepts in education excellence (NIST, 2004, p6). It can be argued that HE governance is largely a translation of the corporate governance to the education sector. The King Report on corporate governance (IoD, 2002b, p.20) says that all companies should give due consideration to the application of this Code insofar as the principles are applicable.

During the end of 2003, in terms of the amended Higher Education Act no 101 of 1997 (South Africa, 1997), the Minister of Education issued regulations for annual reporting by HE institutions. The regulations specify that the "South African Statements on Generally Accepted Accounting Practice" (SA GAAP), should be used for financial reporting by HE institutions. As far as governance is concerned, the requirement is that HE institutions must "comply with relevant standards of accountability for their governance and management as required in the King Report on Corporate Governance" (South Africa, 2003b, p.18,21,26). The Council is required to provide an account of its governance by means of a separate corporate governance statement. A sample of the statement is included in the regulations and reads in part: "The HE institution is committed to the principles of discipline, transparency, independence, accountability, responsibility, fairness and social responsibility as advocated in the King Report on Corporate Governance. Accordingly, the Council endorses, and during the period under review, has applied the Code of Corporate Practices and Conduct and the Code of Ethical Behavior and Practice as set out in the King II Report. In supporting these Codes the Council recognises the need to conduct the business of the HE institution with integrity and in accordance with generally accepted practices. Monitoring the HE institution's compliance with the Code forms part of the mandate of the HE institution's Audit Committee" (South Africa, 2003b, p.28).

2.7. Conclusion

In this chapter the role and the principles of governance in corporations and in HE were examined. This was done to define the environment in which the IT function must be performed, and to identify some principles that can be carried over from corporate and HE governance to the IT governance discipline.

Significant differences exist between private sector corporations and public HE institutions in terms of ownership, control and the structures governing the organisations. More significant than the differences is the common essential requirement for accountability within structures for good governance. In the case of private corporations the accountability is to the shareholders and owners and in the case of HE institutions it is to the state and other stakeholders. In an HE institution, accountability rests on implicit requirements of good governance and the appropriate standards of reporting (South Africa, 2003b, p.93).

Having noted the significant similarity between corporate governance and HE governance, it is reasonable to conclude that much of the best practice for IT governance developed in large public companies will be applicable in HE institutions. In the next chapter the discipline of IT governance will be explored and placed in the context of enterprise governance.

"It's hard to pinpoint when the importance of IT governance became clear to us. It wasn't like a bolt of lightning that struck and left us first stunned but then seeing more clearly. Rather, gradually over a period of years, involving hundreds of conversations with managers and multiple research studies, we became convinced that IT governance is the most important factor in generating business value from IT" (Weill and Ross, 2004, p.vii).

Chapter 3. IT Governance

3.1. Introduction

In the previous chapter the environment in which IT governance operates, specifically the corporate governance and HE governance environment was described. Some principles of governance were highlighted, and the three main components of governance: directing, structures and processes (including the control process) were highlighted. In this chapter IT governance will be described, and the importance of IT governance in a modern organisation will be established. The principles of IT governance will be analysed and the relationship between IT governance and corporate, and more generally, business governance will be established.

3.2. What is IT Governance?

IT (Information Technology and Information Systems) Governance is defined as "A structure of relationships and processes to direct and control the enterprise in order to achieve the enterprise's goals by adding value while balancing risk versus return over IT and its processes" (IT Governance Institute, 2000a, p.5). This definition emphasizes the concept of value, the creation of value, and through risk management, the preservation of value. For clarity it is important to note the definition of control by the same authors: "the policies, procedures, practices and organisational structures designed to provide reasonable assurance that business objectives will be achieved and that undesired events will be prevented or detected and corrected" (IT Governance Institute, 2000c, p.10).

The IT Governance Institute (IT Governance Institute, 2001, p.17) identifies four main focus areas for IT governance, all driven by stakeholder value. Two of them

are outcomes: value delivery and risk mitigation. The other two are drivers: strategic alignment and performance measurement.

According to Professor Robert Roussey, IT governance is the term used to describe how those persons entrusted with governance of an entity will consider IT in their supervision, monitoring, control and direction of the entity. How IT is applied within the entity will have an immense impact on whether the entity will attain its vision, mission or strategic goals (IT Governance Institute, 2001, p1).

Robert Exler, research director from the Robert Francis group, describes IT governance as a framework with five categories of activity using the acronym SPORT (Exler, 2003, p.1). S – Strategy deals with IT alignment with the business and involves many activities, including measurement and metrics for IT projects and planning. P – Policies, processes and procedures. IT governance relies on clearly articulated business policies that can be translated to solid procedures with appropriate checks and balances. IT processes should map to business processes. O – Operations and Organization. The operations aspect involves establishing and maintaining the infrastructure for efficient and effective delivery of IT applications and services. The organization component involves the roles and responsibilities of staff within IT as well as how they map to the rest of the enterprise. R - Regulations. Organisations must operate within the legal framework of their environment. T - Technology. Technology involves evaluation, selection, purchase, and management of the business applications, tools and their providers (Exler, 2003, p.1).

Weill and Woodham defined IT governance as "specifying the decision rights and accountability framework to encourage desirable behavior in the use of IT" (Weill and Woodham, 2002, p.1)

In defining the role and position of IT governance in the organisation, it is useful to consider an organisation's information systems activity as a standalone business within a business. This view assists with the synthesis of the concepts of organisation, planning, control and strategy formulation for IT (McFarlan and McKenney, 1983, p183-184). This conceptual model makes it easier to draw similarities between corporate governance and IT governance. In this model the IT steering committee performs the function of the board of directors in a corporation. The IT director serves as the equivalent of the chief executive officer. The users of

IS services may be viewed as consumers or clients. When this view of the IT organisation is taken, many of the same reasons that makes corporate governance important, also apply to IT governance.

IT Governance should be an integral part of the overall corporate governance, just as IT should be an integral part of the enterprise. It consists of the leadership and organizational structures and processes that ensure that the organisation's IT sustains and extends the organisation's strategies and objectives. The purpose of IT governance is to: (i) ensure that IT is aligned with the organization that it supports; (ii) ensure that IT enables the enterprise to exploit opportunities and maximizes benefits; (iii) ensure that IT resources are used responsibly; (iv) ensure that IT risks are managed appropriately (IT Governance Institute, 2001, p10; Calder and Watkins, 2002, p.1; Van Grembergen, De Haes and Guldentops, 2004, p.3).

The National Association of State Chief Information Officers (NASCIO) chose to describe IT governance as follows: "Governance consists of the leadership, organizational structures, direction, and processes that ensure Information Technology (IT) sustains and extends the enterprise's mission, strategies and objectives in a planned manner" (NASCIO, 2002, p.26).

In their recent book "IT Governance", Peter Weill and Jeanne Ross (Weill and Ross, 2004, p.3) define IT governance as "specifying the decision rights and accountability framework to encourage desirable behavior in using IT." They distinguish between the behavioral view of IT governance and the normative view of IT governance and corporate governance. The behavioral side of governance defines the formal and informal relationships and assigns decision rights to specific individuals or groups of individuals. The normative side defines the mechanisms for formalizing the relationships and providing rules and operating procedures to ensure that objectives are met (Weill and Ross, 2004, p.9-10).

3.3. Why IT Governance?

Information and Communication Technology has a disruptive or revolutionary affect (Ward and Peppard, 2002, p.27; Saloner and Spence, 2002, p.3,7) on the business environment, changing the shape of competition, the dynamics of the customer relationship, the speed of fulfillment, and the nature of leadership. It is thus

important to align the technology with business processes, recognising the importance of the information technology strategies. Ward and Peppard (2002, p15-23) described a "three-era model" to describe the evolution and role of IT in organisations: (i) the data processing era from the 1960s onward where the focus was on operational efficiency through automation; (ii) the management information system (MIS) era from the 1970s onward which focused on management effectiveness through decision support; and (iii) the strategic information systems era from the 1980s onward where technology is used to improve competitiveness by changing the nature or conduct of business. The increasing impact of IT on the modern organisation, explains in part the increased interest in IT governance. The influence and impact of IT on the organisation and the industry is depicted in the following graphical model from Ward and Peppard (2002, p.50-52):

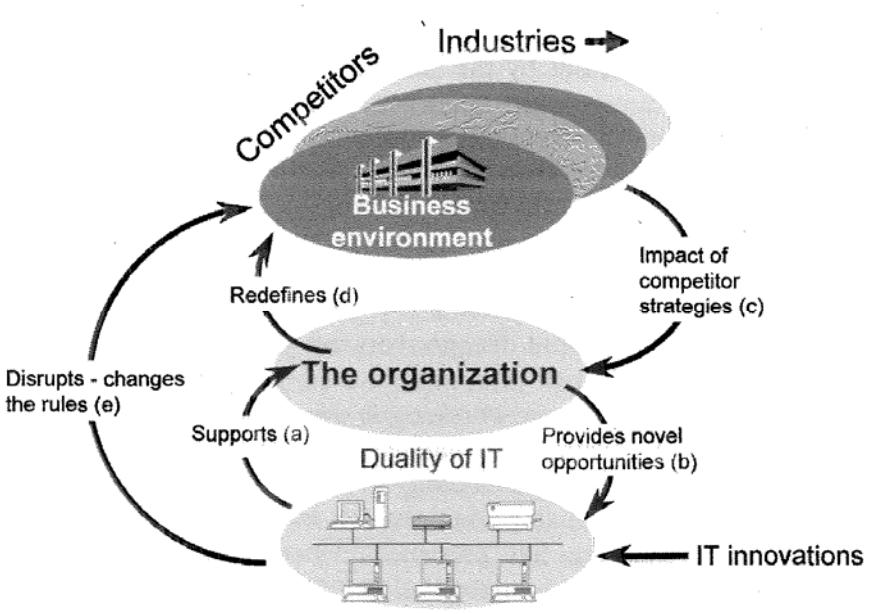

Figure 3.1. The influence and impact of IT (Ward and Peppard, 2002, p.51).

The graphical model in Figure 3.1 illustrates the duality of technology in that it supports the strategy of the organisation (arrow a) but it can also define the business (arrow b). Technological innovations can have a disruptive effect on the industry (arrow e), affecting competition (arrow d), which can, in turn affect the strategies of

the organisation (arrow c.). Business leaders increasingly realise that business strategy influences IT, but also that IT influences the business strategy. A strong argument can thus be made that IT is a matter that should be on the board's agenda.

Effective management of information and related technology is critical to the survival and success of an organization. (IT Governance Institute, 2000c, p.3). In 2003 the Meta Group noted that a key focus for Global 2000 organizations was to attain higher organizational value. Their conclusion was that this requires the managing of the IT organization as a business entity (Meta Group, 2003, p.1). Bill Gates is quoted to have said: "I have a simple but strong belief. The most meaningful way to differentiate your company from your competition, the best way to put distance between you and the crowd, is to do an outstanding job with information. How you gather, manage and use information will determine whether you win or lose" (Ward and Peppard, 2002, p.615). Information Technology is an integral part of a modern organisation that must be subject to high standards of governance for a number of reasons. In a modern organisation, there is a strong dependence on IT to deliver critical information to the organisation, and to support business transactions. There is also an increased vulnerability of organisations due to a wide spectrum of cyber threats. Many organisations have made huge investments in IT, and it has become an important resource that should be governed properly. The mere purchase of IT does not confer any benefit to the organisation, the wise use of this resource may add tremendous value (Ward and Peppard, 2002, p.5). One study conducted in 1995 concluded that the overall success rate of IT projects was only 16.2 percent (Schwalbe, 2002, p.3). The cost, as well as the risks associated with these projects, demands management attention. Changepoint Corporation cites some examples of weak IT governance and board-level guidance. These include: Disney that suffered a $878 000 000 write off due to poor decisions by its Internet division; Kmart that wrote off $130 000 000 for supply chain hardware and software; Gateway that disposed of $143 000 000 worth of IT investments that no longer fitted the company's strategy and Nike's "difficulty with implementing supply chain software in 2001 contributed to a $400 million mistake" (Changepoint Corporation, 2004, p.2-3). IT failures may significantly impact on the reputation and value of an organization. Technology has the potential to dramatically change an organisation

and its business practices. Information and information technology have become the most valuable assets in many organisations. (IT Governance Institute, 2000a, p.5).

The need for IT governance is related to the importance of information in a modern organization. The nature of the firm has changed. The basis for power was historically the ownership of assets. This has changed with the increased importance of innovation through research and development, process innovation and quality improvement in modern organizations. Innovation comes from "human capital", and thus human capital has become more important than physical assets in modern organizations (Raghuram and Zingales, 2000, p.387-482). Kaplan and Norton (2004, p.3-5), authors of the balanced scorecard strategic models, noted that, even after the busting of the NASDAQ and dot-com bubbles, intangible assets, those not measured by a company's financial system, account for more than 75 percent of a companies value. The most significant enabler in the modern business, as far as innovation and business relationship with customers are concerned, has been technology. Business process re-engineering is almost synonymous with the application of ICT. Hence, the governance of a modern organization must necessarily place a high value on the governance of the IT assets.

Power is about control over valuable resources in the organisation (Raghuram and Zingales, 2000, p.406). Governance is about control over the assets and the direction of the organization involved. Raghuram and Zingales argue that control over human capital would be a greater source of power than control over physical assets of an organization. They further reason that human capital cannot be bought or sold (that would amount to slavery). During the last decade or two, businesses have come to recognize information as one of the most valuable assets, along with capital and the human resource. Control over the information assets of the organization has led to a shift in power in the hands of the information managers. It follows that the information resources should be well governed.

IT governance is necessitated by the large amounts of money companies, including HE Institutions, spend on ICT. The strategic opportunities and the risks that those investments in IT present make IT governance important to the highest management body in the institutions. IT investment represents more that 50% of capital expenditure in many companies (Changepoint Corporation, 2004, p.1).

Peter Weill, the director of the Center for Information Systems research at MIT came to the conclusion that effective IT governance framework is the single most important predictor for getting value from IT (Weill and Woodham, 2002, p.5; Weill and Ross, 2004, p.3-4)

IT must be recognized as a strategic resource creating strategic threats and strategic opportunities to many modern organizations (Weill and Ross, 2004, p15; Pretorius, 2003, p36). McFarlan and McKenney (1983, p.199) warned about having a limited view of the information business as being the electronic based computer, telecommunications or office automation business. Their description of the information business is "the business bringing a sustained stream of innovation in information services to change the company's internal and …. its external products" They further comment that far too many IT directors "myopically believe that they are running a computer center. Failure to perceive and act on their broader role will lead to a collapse of their operations, probable loss of jobs, and great disservice to their customer base." Sallé (2004, p.1) observed that because of its increasing role in the enterprise, the IT function is changing from a technology provider to a strategic partner. This strategic partnership should be managed at the highest levels in the organisation.

Stricter control over information resources has become mandatory through recent changes in the regulatory environment. Control includes policies, organizational structures and processes (practices and procedures) (IT Governance Institute, 2000c, p3; Lainhart, 2000, p.21). Corporate governance standards in many countries refer specifically to the management of the IT environment and make the top executives and the board accountable for the security of their information resources (IoD, 2002b, p22; Calder & Watkins, 2002, p.1). The management of IT related risk and performance is recognized as part of enterprise governance.

Popper (2000, p3) believed that there are "three primary objectives for the proper management of IT: (i) alignment of the IT function with business, strategically and tactically; (ii) a value/cost relationship, in which the cost of IT is clearly related to the value it adds to the enterprise; and (iii) 'operational excellence,' that is, the delivery of IT projects and services with high quality, high efficiency, and predictable levels of service, all of them to be described and measured in business

terms." A key point that is made is that IT governance should be concerned with new IT initiatives, and the cost-justification for new initiatives, but that they should also be concerned with the actual delivery (or lack thereof) and the efficiency of the systems over time. Popper puts it this way: "Neither the development phase nor the production phase alone can create business value; both are necessary. What is needed, therefore, is a shared and consistent approach to managing both the value and the cost of production." Popper argues that a project management approach to IT management is not adequate and that a holistic approach to IT management would include ongoing operation and monitoring of the system to achieve business objectives (Popper, 2000, p.6).

IT governance standards were developed in response to the finding that the complexity of IT and the intangible value of information make IT a more difficult area to govern (IT Governance Institute, 2001, p8). Senior management does not have the bandwidth to get involved in the many IT-related decisions that must be made. If they try to make too many decisions, they become a bottleneck. IT governance provides a clear, transparent IT decision making process in line with the organisation's strategies, while empowering individuals to be creative (Weill and Ross, 2004, p.18).

3.4. The relationship between Corporate Governance and IT Governance

If the relationship between corporate governance and IT governance can be established, it becomes reasonable to argue that much of the corporate "best practice" principles can be applied to IT governance. As far back as 1983, McFarlan and McKenney, both of the Graduate School of Business Administration, Harvard University, described the IT organisation as a business within a business (McFarlan and McKenney, 1983, p.193-198). They asked the question: "What should be the relationship between the firm's general management to the IS business?" They concluded that it is similar to the board of directors for any business and that it is given de facto recognition through the creation of an executive IT steering committee. Almost 20 years later, Ward and Peppard (Ward and Peppard, 2002, p.370) found that most organisations in the private and public sectors, have established some form of "steering group", usually having the words "policy",

"strategy" or "planning" in the title. They argued that the most compelling reason for the establishment of these committees is that the formal organisation structures for IS/IT activities are never seen to be satisfactory by all parties involved, and additional 'governing' processes become necessary, whether IT resources are centralized or decentralized (Ward and Peppard, 2002, p.372). McFarlan and McKenney go on to identify the role of management (analog to the board of directors of a business) as:

- The appointment and continued assessment of the performance of the chief executive officer (a normal function of the nominating committee).

- Assuring that appropriate standards are in place, and compliance with those standards. This includes reports from the IS auditor and review by external auditors. This is a normal function of the auditing committee in corporate governance structures.

- To provide overall guidance to the IS business from its various stakeholders.

- To provide broad guidance on the strategic direction of the IS business, and to ensure that proper planning processes are taking place in the IS business, and that that the plans are aligned with the strategic direction of the business.

McFarlan and McKenney (1983, p.193-198) took the analogy further and describe the role of the IT manager in the terms of the chief executive officer (CEO). They identified some of the responsibilities of the CEO of the IT business within a business as:

- Maintaining board relationships personally. This includes keeping the board fully informed of policy issues, problems, needs and concerns. The board (steering committee) represents the stakeholders.

- To ensure that the strategy formulating processes are functional and that appropriate action plans are developed.

- Pay close attention to salary, personnel practices and employee quality-of-life issues.

- Giving high priority to “factory security”.
- Ensuring that there is an appropriate balance between the “marketing”, “manufacturing” and “control” parts of the business.
- Developing a team spirit and leading their IT organisations with enthusiasm”.

Governance is about control over the direction and the assets of the organization involved. In a corporation control is required over the accumulation of power in the hands of the managers as proxy owners of the institution. Control is required to see that the interests of the stakeholders are equitably met. Control is required to ensure the efficiency and effectiveness of the institution, and that the accumulation of power does not lead to organizational slack. The link between the exercise of power and efficiency is well established (Raghuram, Rajan and Zingales, 2000, p.7). Control is required to ensure the sustainability of the organization and that it remains relevant (“aligned”) with the needs and expectations of the owners and major stakeholders. The major assets of the modern organization are its human resource, capital and its information assets. The initial focus of corporate governance was on the control and distribution of the assets of the public corporation. Power had to be exercised over management so that the interest of the owners (shareholders) would be served. The basis for power in the organisation was historically on the grounds of ownership of assets. Information and information technology is generally accepted as one of the most important resources in the modern organization. A study which involved more than 250 organisations led Weill and Ross (Weill and Ross, 2004, p.22) to conclude that IT is the least understood and most poorly utilized key asset in many organisations. IT is a specialized area, requiring the services of managers who have specialized in that area. Governance is thus required to manage the inordinate accumulation of power in the hands of the IT managers to ensure alignment, efficiency, effectiveness and the management of risk and opportunities in the area of ICT.

Enterprise governance has as one of its aims the alignment of the different structures and processes within the organization. For the sake of clarity the NIST definition of “alignment” is given: “The term ‘alignment’ refers to consistency of plans, processes, information, resource decisions, actions, results, and analysis to support key organization-wide goals. Effective alignment requires a common understanding

of purposes and goals. It also requires the use of complementary measures and information for planning, tracking, analysis, and improvement at three levels: the organizational level/senior leader level; the key process level; and the program, school, class, or individual level" (NIST, 2004, p.38). IT governance is essential for the success of enterprise governance because the adoption of generally accepted good practice gives assurance that efficient, effective and measurable improvements are made in related enterprise governance processes. IT governance policies, structures and processes integrate the IT function with the rest of the enterprise functions. IT governance enables the enterprise to align the IT function with the enterprise objectives. One study which involved executives from over 500 firms representing 15 industries was conducted during the period 1992 – 1997 to identify the most important enablers and inhibitors for IT/Business alignment. One of the findings was that the single most important enabler for IT/Business alignment is "senior executive support for IT", and the most important inhibitor was "IT/business lack close relationships" (Luftman, Papp and Brier, 1999, p.4). It can be concluded that alignment between the business and IT is important for IT projects to succeed, and also that business will derive most benefit if the top executives are involved and committed to appropriate business related IT projects.

The King Report (IoD, 2002b, p.147) makes the link between IT and corporate governance with the statement: "While technology developments can help improve governance, they have also brought increased risks and challenges that need to be addressed for management to discharge their governance responsibilities." The King Report (draft version) then goes on to list areas where IT has a significant impact on corporate governance that can be summarised as follows (IoD, 2002b, p.147-150):

- Internal control system

  The directors have a responsibility to ensure that an effective internal control system is being maintained (IoD, 2002, p.147; Calder & Watkins, 2002, p.21). Modern computer based systems are an integral part of many organisations. The introduction of these systems has had far-reaching implications for management and auditors alike. The controls and processes incorporated in modern computer based systems have to be evaluated and tested. Responsible management needs to demonstrate adequate knowledge

of modern IT-enabled systems as well as an appreciation of the related changes in the organisation's internal control systems.

- Reporting.

  IT is a potentially powerful enabler for making information available to stakeholders. Many organisations publish financial and other relevant information on web sites, while e-mail is a highly effective means of sharing information. There have been recommendations and debate around issues such as interim reporting, preliminary announcements, press releases and the scope and content of annual reports.

- Fiduciary implications

  The laws and regulations affecting IT typically have a greater emphasis on intellectual property rights. Accordingly, the organisation needs to be sensitive to its exposure in these areas. Blurred organisational boundaries that arise as a result of e-business initiatives also affect on statutory compliance.

- Business

  The introduction of e-business initiatives has resulted in a fundamental change in the way that business is conducted. This change has implications for internal control systems, as well as statutory compliance with legislation.

- Technology

  Technology has had a fundamental impact on the way in which business is conducted and businesses are measured. Many stakeholders in organisations do not have a full understanding of the true opportunities and threats facing the organisation. Consequently, the importance of the basic tenets of good governance is particularly significant. Management need to provide complete honesty and transparency in reporting on organisational results and prospects.

- Cost/value relationship

Management must give due consideration to the cost/value relationship in considering IT strategy. The high rate of development and obsolescence in IT makes decisions on IT expenditure particularly important (IoD, 2002b, p.147-50).

As highlighted in the previous chapter, the role of the board is to oversee and advise management and to represent the interest of the stakeholders of the corporation. Major strategic issues require the board's approval. The issues identified above, are some of the issues that the King Report considers as issues that should receive board attention. Some of these issues are of strategic importance, others are related to the risk associated with either deploying, or not deploying IT, and other issues relate to IT in support of enterprise governance.

The IT Governance Institute makes the assertion that to achieve success in the information economy, enterprise governance and IT governance can no longer be considered separate and distinct disciplines. Effective enterprise governance focuses individual and group expertise and experience where it can be most productive, monitors and measures performance and provides assurance to critical issues. IT is no longer considered solely an enabler of an enterprise's strategy, it is now regarded as an integral part of that strategy (IT Governance Institute, 2000c, p.7; IoD, 2002b, p.147).

The IT Governance Institute uses two graphical models with associated descriptions to describe enterprise governance and IT governance. Figure 3.2 below is a reproduction of their enterprise governance model, and figure 3.3 is a reproduction of their IT governance model.

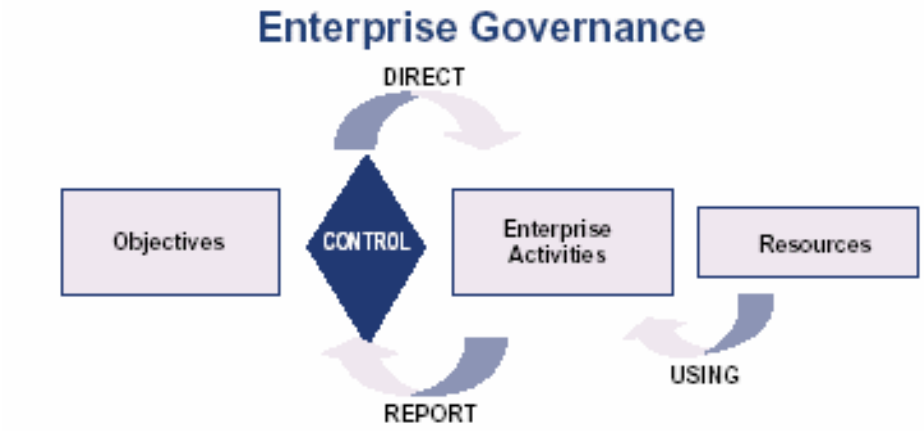

Figure 3.2. Enterprise Governance (IT Governance Institute, 2000c, p.7).

The model is described as follows. Enterprises are governed by generally accepted good (or best) practices to ensure that the enterprise is achieving its goals. The assurance is guaranteed by certain controls. These objectives determine the organisation's direction, which dictates certain enterprise activities, using the enterprise's resources. The results of the enterprise activities are measured and reported on, and serves as input to the constant revision and maintenance of the controls (IT Governance Institute, 2000c, p.7). The IT governance model and associated description are remarkably similar as can be noted from the figure 3.2 below.

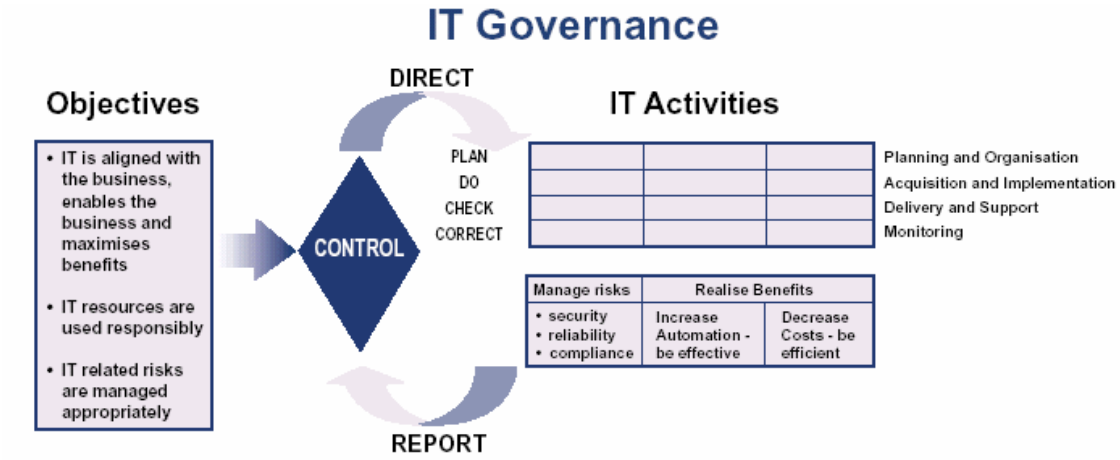

Figure 3.3. IT Governance (IT Governance Institute, 2000c, p.8).

The IT Governance Institute description of the IT governance model is as follows. IT also is governed by good (or best) practices, to ensure that the enterprise's information and related technology supports its business objectives, its resources are used responsibly and its risks are managed appropriately. These best practices provide direction for IT activities, which can be classified as planning and organising, acquiring and implementing, delivering and supporting, and monitoring. The objectives for IT governance are to manage risks (to gain security, reliability and compliance) and to realise value (increasing effectiveness and efficiency). Reports are issued on the outcomes of IT activities. The IT activities are measured against the various practices and controls, and the cycle begins again with providing direction for the IT activities (IT Governance Institute, 2000c, p.8). The governance process starts with setting objectives and direction, for the IT function, followed by a continuous loop of measuring performance, comparing outcomes with objectives,

and then re-defining of objectives or activities as appropriate (IT Governance Institute, 200c, p.10).

IT governance involves the board and executive management providing the leadership, organizational structures and processes that ensure that the organisation's IT sustains and extends the organisation's strategies and objectives (IT Governance Institute, 2001, p.6). IT governance thus occurs within a structure where, for example, team leaders will report to managers, managers will report to the executive, and the executive reports to the board. Goals and directives flow in the opposite direction within the defined structure. IT governance, like most other governance activities, requires cooperation between the board and executive management (IT Governance Institute, 2000c, p.13).

Will and Ross summarise the relationship between corporate governance and IT governance well by stating that IT governance reflects broader corporate governance principles while focusing on the management and use of IT to achieve corporate performance goals (Weill and Ross, 2004, p.2). They depict the relationship between corporate governance and IT governance as follows in figure 3.4 (Weill and Ross, 2004, p.5):

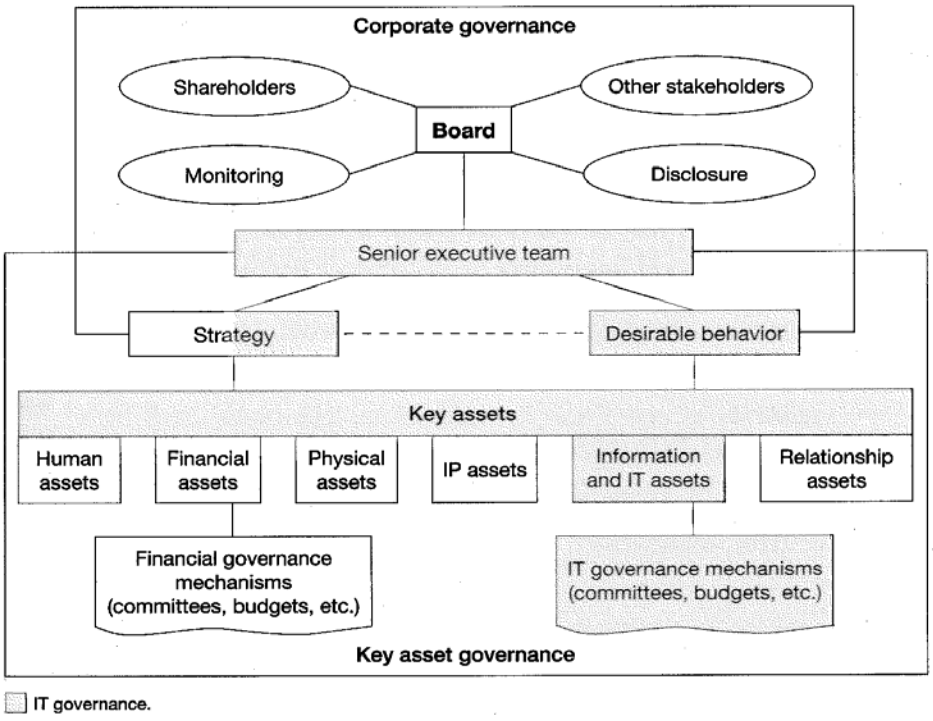

Figure 3.4. Corporate and Key Asset Governance. (Weill and Ross, 2004, p.5)

In their model, Weill and Ross see strategy as a set of choices such as: Who are the target customers? What are the product and services offered? What core processes embody the form's unique market position? They assert that behaviors, and not strategy, are what creates value in the organisation. Behaviors embody the beliefs and culture of the organisation as defined and enacted through strategy, corporate value statements, mission statements, business principles, rituals and structures (Weill and Ross, 2004, p.6). Weill and Ross (2004, p.7) identify six key asset groupings through which enterprises accomplish strategies and create business value. These are:

- Human assets with key elements including people, skills, career paths, training, reporting, mentoring and competencies;
- Financial assets;
- Physical assets including buildings, plants, equipment;
- Intellectual property (IP) assets including process know-how;
- Information assets with elements such as data, information, knowledge of customers and process performance;
- Relationship assets with elements such as brand and reputation with stakeholders including customers, suppliers and channel partners.

Weill and Ross (2004, p.7) further identify several organizational mechanisms used to govern the assets, including structures, processes, committees, procedures and audits. Their research leads them to conclude that maturity of governance over these assets vary greatly within many organisations, with physical and financial assets typically best governed, and information assets among the worst. Weill and Ross (2004, p.7) contend that most value is created when common mechanisms are used to govern multiple assets, for example, if the same executive committee governs both IT and financial assets.

One of the most common reasons given for failed IT projects is a lack of support from top management. Calder and Watkins (2002, p.34-35) state that if the CEO, the chairman and the board are not behind a BS7799 information security certification

programme, there is little point in proceeding with such a project, as certification will not happen without clear evidence of such commitment.

The Australian Standards Body, Standards Australia, prefers to use the term "corporate governance over ICT" rather than "IT governance. This underscores the relationship between the disciplines (Standards Australia, 2004, p.1).

In summary it can be said that governance is about obtaining assurance that the business is run properly in respect of setting strategy and direction, managing risk, delivering value (in relation to what is valuable to the stakeholders) and measuring performance. The above applies to governance of the overall business as well as the IT business level.

3.5. Important IT Governance Concepts

The essential components of sound IT Governance include (Changepoint corporation, 2004, p.1) : effective decision making and strong focus on process; IT and system portfolios that are aligned with business priorities; an efficient and cost effective IT function; customer focus; complete audit capabilities supporting each of the above points.

Simply put, effective IT governance must address the following questions (Weill and Ross, 2004, p.10): What decisions must be made to ensure effective management and use of IT? Who should make these decisions? How will these decisions be made and monitored?

Addressing the first two questions, Weill and Ross developed what they refer to as a governance arrangements matrix, and they classify IT decisions that must be made into five groups:

- IT principles – clarifying the business role of IT.
- IT architecture – defining integration and standardization requirements.
- IT infrastructure – determining shared and enabling services for the organization.

- Business application needs – specifying the business need for purchased or internally developed applications.

- IT investment and prioritization – choosing how much, and what to spend on IT initiatives.

- IT governance involves defining who will be responsible for making what decisions and how they will be made. The governance arrangements matrix classifies the decision makers into political archetypes (Weill and Ross, 2004, p.10-13):

- Business monarchy- top managers make the decisions.

- IT monarchy – IT specialists are the decision makers.

- Feudal – each business unit makes their own decisions.

- Federal – combination of the business units and the central IT service.

- IT duopoly – IT group and one other group (for example top management).

- Anarchy – isolated individual or small group decision making.

Effective governance deploys several IT governance mechanisms. Weill and Ross (2004, p.86-108) identified and discussed fifteen of the most common IT governance mechanisms. These mechanisms can be grouped into three types of mechanisms as follows:

- Decision-making structures such as committees, executive teams and business/IT relationship managers. The latter is regarded as one of the mechanisms that add most value to the business.

- Alignment processes such as IT investment processes, service level agreements, chargeback (often associated with negative side-effects) and the use of metrics.

- Communication approaches including announcements and education efforts.

The concepts of transaction costs and the Grossman-Hart-Moore (GHM) incomplete contracts theory of the firm are valuable conceptual tools to analyse governance structures (Suomi & Tahkapaa, 2004, p.365). The key concept of GHM theory is that real world contracts are almost always "incomplete", in the sense that it is impossible to foresee all the contingencies that are left out of the contract, and it is simply too expensive to attempt to set up very comprehensive and extremely detailed contracts. This then implies "residual rights", which, if it pertains to an asset, accrues to the person called the "owner" of the asset (Brynjolfsson, 1993). The simple allocation of authority through organizational structures, deals very efficiently with the cost otherwise associated with more complex negotiations in an incomplete contract situation. This theory can be used to explain, in part, why the simple hierarchical organisational structure is such a prevalent governance mechanism.

The transaction cost theory of the firm is essentially that organizations exist because the organization is a mechanism where transactions between elements in the organization are much lower than transactions with elements outside of the organization structure. Transaction cost theory was developed to explain why certain activities, products or services are carried out in the organization, while others are transacted in the open marketplace (Canback, 1998, p.20). Based on this theory, the organization will function most efficiently if the entities that interact most frequently are grouped together in organizational units. Based on the frequency of interactions, clusters of persons forming logical groups or sub-units in the organization (one such grouping being the IT function) can be recognized. This theory can (along with the theory of incomplete contracts) also be used to explain in part the high failure rates associated with outsourcing arrangements. The theory is also useful to make organizational planners more sensitive to the effect of bureaucratic policies and procedures on efficiency and organizational tension.

It must be noted from the above that IT governance does not prescribe what the most appropriate governance structure for an organisation is. That would depend on many factors, including the size, the culture and the strategic approach that the organisation chooses to use to achieve competitive advantage.

3.6. Relationship between Corporate Governance Principles and IT Governance Principles.

In Chapter 2, the seven characteristics of good governance, as identified by the King Report, were highlighted (IoD, 2002b, p.10-11). It can be argued that one can expect to find these characteristics in a good IT governance framework as well. The characteristics, with application to IT governance, are briefly discussed below.

- Discipline. Corporate discipline is described as "a commitment by senior management to adhere to behavior that is universally recognized and accepted to be correct and proper." In the IT environment several codes, standards and frameworks describe behavior that is widely accepted as best practice. Some of the standards are more specific, covering areas such as security, while others cover aspects such as quality (Heiman, 2002, p.15).

- Transparency. With this term is meant the ease with which an outsider is able to make a meaningful analysis of the organisation's financial, as well as non-financial, actions. The information must be candid, accurate and timely. It can therefore be expected to find best practice guidelines in an IT governance framework regarding key performance indicators covering the different aspects of performance.

- Independence. The term independence is used to refer to "the extent to which mechanisms have been put in place to minimize or avoid potential conflicts of interest, such as the dominance by a strong chief executive or large shareholder." The purpose is so that objective decisions can be made, free from undue influences. The mechanisms in corporate governance include composition of the board, appointment of committees of the board, and the appointment of external parties such as auditors. In an IT governance framework the equivalent would be mechanisms for minimizing the undue dominance of the Chief Information Officer (CIO), and that decisions can be made by the organisation representatives (e.g. IT Strategy Committee) in the best interest of the organisation.

- Accountability. Individuals or groups in a company who make decisions and take actions on specific issues need to be accountable for their decisions and

actions. Mechanisms must exist and be effective to allow for accountability. These mechanisms must provide investors with the means to assess the actions of the board and its committees. Accountability and responsibility goes hand in hand with organisation structure. It is therefore reasonable to expect that IT governance should provide best practice guidelines in this regard.

- Responsibility. With regard to management, responsibility refers to behavior that allows for corrective action and penalising mismanagement. A person might want to look for mechanisms that will either reward or penalize good or bad management in an IT governance framework.

- Fairness. The rights of various stakeholders must be acknowledged and respected. In the context of an IT governance framework, it could be expected to find controls that ensure that this will take pace.

- Social responsibility. The King report emphasizes that a well-managed company will be aware of, and respond to, social issues, placing a high priority on ethical standards. The King Commission is of the opinion that governance in any context should take account of the value system of the society. The potential impact of IT in the workplace cannot be disputed. It is therefore reasonable to expect that IT practitioners should be sensitive to social issues and ethical standards, and that controls in this regard would be appropriate.

The principles of accountability and responsibility imply the existence of an organizational structure. The matter of IT governance structures is briefly discussed in the following section.

3.7. IT Governance and Organisational Structures

Traditionally, organisations have relied on organizational structures to align decision making with enterprise goals and strategies. Organisational structures have provided necessary, but inadequate support for the execution of strategy because of competing goals, expanded geographies, rapid change and intense competition (Weill and Ross, 2004, p.71)

Corporate governance is concerned with how an organization is managed, which includes the structures, processes and control and accountability for results (Psaros and Seamer, 2002, p.6; Shockley and April, 2003, p.28-29). The board has the ultimate responsibility for the decisions and activities of the organization, which includes the IT components of the organization (IoD, 2002b, p.22). It is then no surprise to find that best practice recommendations include specific recommendations regarding organisation structures such as the establishment of board-level IT oversight committees.

Steering committees appear to be an obvious necessity in managing IT (Ward and Peppard, 2002, p.370). They are called many things, but generally have the words 'policy', 'strategy' or 'planning' in the title. Changepoint Corporation (2004, p.7) considered the charters of board-level IT oversight committees at two organizations (Mellon Financial corporation and FedEx Corporation), and identified the objectives of such committees as:

- To advise senior business and IT management in developing operating and strategic plans that take full advantage of existing and emerging technology.
- To review proposals for potential technology investments.
- To oversee major IT related projects and IT architecture decisions
- To monitor the performance of IT to ensure that it is aligned with business strategic objectives.

Ward and Peppard (2002, p.375) add another important function to this list and that is: "establishing the appropriate organizational responsibilities and relationships." The CobiT (IT Governance Institute, 2002) recommendations include that the IT Strategy Committee is composed of a chairman, several board and non-board members and ex-officio representation of key executives. The chairman should be a board member. The members should be selected on the basis of their knowledge and expertise in understanding the business impacts of information and related technology.

IT decision making must, however, be devolved into the organization, and this requires the outlining of authority and responsibilities. Corporate management must

define organisational responsibilities regarding IT management. Corporate management must also decide if, and how, that structure must be overlaid by other governing structures such as committees and steering groups (Ward and Peppard, 2002, p.345). Decisions made at lower levels must be in line with the policies and procedures set at a higher level in the organizational structure, and follow the mechanisms in place to achieve coherence over a number of decision areas. Authority lies with the individuals or groups that have the power actually to make decisions in the various areas. The entity making the decision is accountable for the decisions made. Some decisions may have to be ratified by a committee of some sort. Individuals or bodies may have the responsibility for the execution in a decision area. Roles that carry responsibility do not necessarily carry authority. In other words, some persons may not have decision making authority, but will only have the responsibility to carry out the decisions made by a higher authority (Ward and Peppard, 2002, p.357).

Ward and Peppard (2002, p.374) note that most good ideas originate lower down from the executive steering group in the organization. The role of the steering group is to evaluate the opportunities, initiate action and then to monitor whether success is achieved. They then propose a governance structure for steering IT strategy as depicted in Figure 3.5 below.

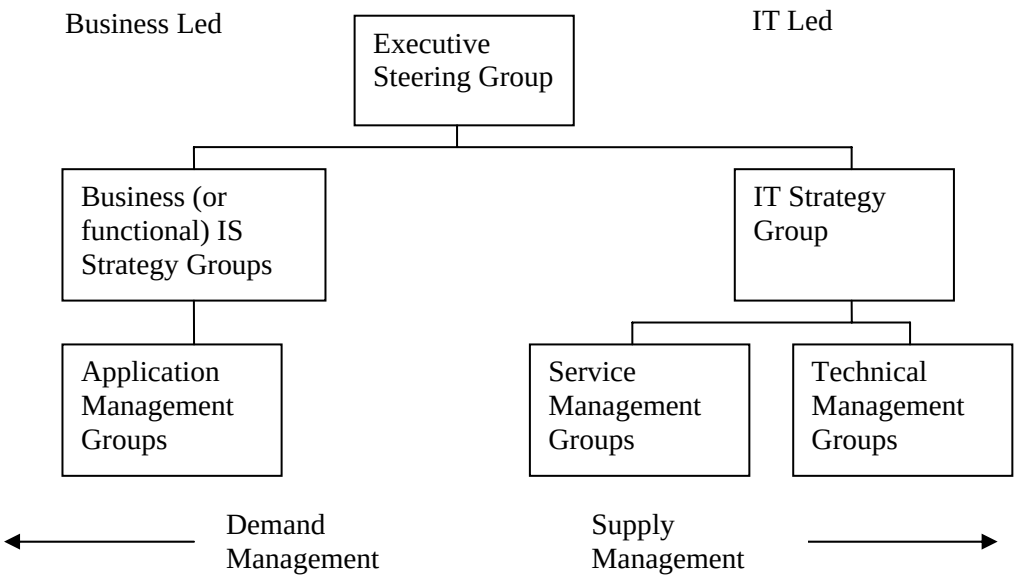

Figure 3.5. Steering organization for IT strategic management (Ward and Peppard, 2002, p.374)

A brief description of the role of the business IT strategy Groups, the application management groups, the IT strategy group, the service management groups and the technical management groups, as depicted in figure 3.5, are outlined below (Ward and Peppard, 2002, p.374-384):

- A Business unit IS (Information System) strategy group may be established for each business unit or major function. The senior business managers in the business unit should be involved, and ideally the chairman of this group should be the same person as the representative of the business unit on the executive IS steering group. Ward and Peppard summarised the functions of this group as follows: identifying business needs, interpreting critical success factors (CSFs), assessing opportunities and threats and IS implications in that business area; prioritizing, planning and coordinating IS activities and expenditure in the area and ensuring planned benefits are delivered; ensuring appropriate user resources are allocated to projects and appoint application managers.

- The IT strategy group has the following main responsibilities: interpreting IT trends and developments in the context of the organization's business; ensuring resources are deployed to meet business priorities; developing IT resources and services in line with business information systems plans and monitoring the performance of those resources; managing the supp1y of technology and specialist outsourced services; ensuring technical risks are managed.

- Application management groups have the following functions: identify and specify the needs, benefits, business resources and costs of applications to enable management to evaluate investments and set priorities; manage systems to ensure benefits are maximized; ensure that user resources are made available as needed and used effectively on projects.

- Service management groups must: translate business needs into technical requirements and resource implications; ensure technical solutions are tested and quality assured to avoid application failure; plan the development of services and resources to meet evolving demands

- Technology management groups. The role and responsibilities of these groups may include: to understand technology development, formulating options and communicating the implications; to assess technology capabilities for potential application to meet business needs; to plan and manage infrastructure with due consideration of risk to business applications; to ensure that service groups are effectively supported.

Information security management is an area that also requires a security organisation. The ISO 17799 standard, clause 4.2.1.1., specifies that a management information security forum must be in place, and clause 4.2.1.2. specifies that optionally there should be a cross functional forum (subordinate to the aforementioned forum) to coordinate the implementation of controls (Calder and Watkins, 2002, p.37, 40). ISO 17799 also call for an information security manager, and throughout the organisation, individual owners of information assets. IT departments should be responsible for the overall security of the systems for which they are responsible. Local administrators of systems might have specific responsibilities such as user creation and deletion, system monitoring, change control, data backup, and testing contingency plans. Likewise System managers, network managers and site managers might have different security responsibilities(Calder and Watkins, 2002, p.45).

The above mentioned structures are by no means prescriptive, or applicable to all organisations, but it does give some indication of the mechanisms and structures that are often found in organisations.

One of the key IT decisions that business is faced with, is what sourcing options should be used to resource the IT function. The options are usually classified as insourcing, outsourcing or partial outsourcing (Ward and Peppard, 2002 , p.359-364). Outsourcing can be defined as the delegation, through a contractual arrangement, of all or part of the technical resources, the human resources and the management responsibilities associated with providing IT services, to an external vendor (Ward and Peppard, 2002, p.360). Popper (2000, p.20) noted that the matter of outsourcing had been hotly debated since the 1980s, and identified two factors fundamental to the decision to outsource: the conclusion that the enterprise's internal IT organization has failed to achieve the value/cost relationship that management desires; and the expectation that the outsourcer perform this task better. Popper observes that, in most

cases, the data to support these assertions are sorely lacking, but that a holistic IT Governance framework, which includes objectives, measures and benchmarks, can assist with the decision as well as the management of specific IT areas that might be outsourced. Van Grembergen et el. emphasized that IT governance is organisation specific, and direction and control over IT can never be outsourced (2004, p.4).

The Application Portfolio matrix approach of classifying IT Services as described by Ward and Peppard (2002, p.42) is useful for supporting decisions relating to the management ad structure of IT services. The basic classification can be summarised as in figure 3.6. below:

STRATEGIC **Applications *critical to* sustaining future business strategy.**	**HIGH POTENTIAL** **Applications that *may be important* in achieving future success.**
KEY OPERATIONAL **Applications, which the institutions *currently depend* on for success.**	**SUPPORT** **Applications that are *valuable but not critical* to success.**

Figure 3.6. Application Portfolio Matrix (Ward and Peppard, 2002, p.42).

This model is extremely useful as each of these groups of applications usually has different requirements in terms of management approaches and style, funding approach, outsourcing potential and customer focus. For example, if an application is classified as strategic, the decision may be not to outsource, based on the fact that several studies have shown that the fundamental skills to create a future range of competitive products cannot be rented by means of outsourcing (Roy and Aubert, 2002, p.29, 32). It is important to note that even with complete outsourcing, there are vital competencies that must be maintained in-house to monitor and manage the contractual relations, track assess and interpret changing IT capability and relate

them to organisational requirements, and define IT requirements over time (Ward and Peppard, 2002, p.363).

3.8. Developments in IT Governance (History)

Sallé described the evolution of the IT function, as depicted in figure 3.7. below (Sallé, 2004, p.1). Three evolutionary stages are described, starting with IT infrastructure management, developing to IT service management, and finally IT governance

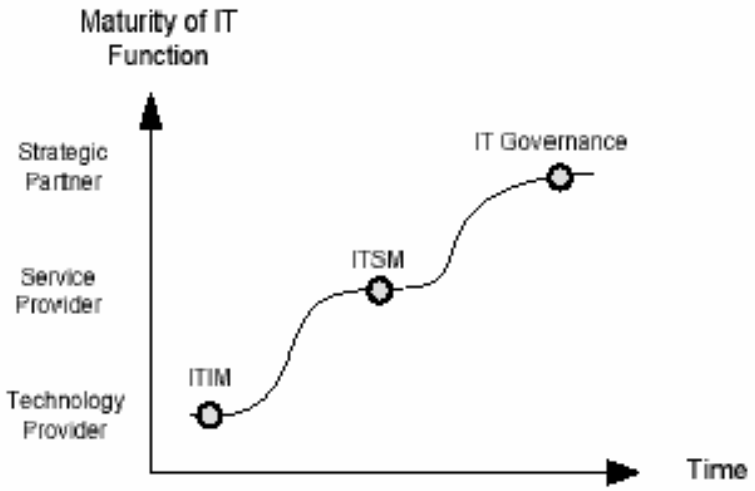

Figure 3.7. Evolution of the IT function within Organisations

During the IT infrastructure management phase, the IT organizations focus on improving the management of the enterprise infrastructure. During this phase the emphasis is on computing assets and taking control of the infrastructure, the devices it contains and the data it generates. During the next stage, IT service management (ITSM), the IT organizations focus on services that their customers need and on planning and delivering those services to meet availability, performance, and security requirements. During this phase attention is paid to service-level agreements, both internally and externally, to meet agreed-upon quality and cost targets. During the third phase, IT business value management (IT Governance), the IT department is transformed into a true business partner. In that stage, IT processes are fully integrated with the business processes (Sallé, 2004, p.1). Sallé's phase 2 characteristics include: IT is for efficiency; budgets are driven by external benchmarks; IT is separable from the business; IT is seen as an expense to control;

and IT managers are technical experts. The third phase is characterized by some of the following: IT for business growth; budgets are driven by business strategy; IT is inseparable from the business; IT is seen as an investment to manage; and IT managers are business problem solvers (Sallé, 2004, p.2). The evolutionary stages that Sallé describes, corresponds significantly with the three-era model described by Ward and Peppard (Ward and Peppard, 2002, p.22-59) and the four stage model described by Gottschalk (2004, p.252). The three eras described by Ward and Peppard (2002, p.22-59) are the Data Processing era (1960s onwards) followed by a MIS era (1970s onwards) and then an SIS (Strategic Information Systems) era (1980s onwards). During the second era the IS (Information Systems) resource moves from a production to a service orientation, and the information centre concept is established. The third era (SIS era) could be recognized by more and more organisations using IT (IT used in its widest meaning to refer to information systems including the technologies) in ways that fundamentally changed how their business was conducted, and IT management becoming a strategic issue, grabbing top management attention. This SIS era clearly has characteristics of Sallé's IT governance era. Ward and Peppard then describe an emerging of a fourth era, what they call an "organizational IS capability" era. They refer to some studies that showed that in general, only 20% of these companies could obtain sustained advantage for ten years or more (Ward and Peppard, 2002, p.26; Luftman, Papp and Brier, 1999, p.3). They noted that a clear distinction between sustainability and competitive advantage must be drawn. In their words: "When competitive advantage is enduring, it is not that a particular outcome is enduring, but that there is something in the very fabric of the organisation contributing toward creating ongoing and continuous advantage" (Ward and Peppard, 2002, p.53). Although never using the term IT governance, Ward and Peppard (2002, p.53) concluded from their research that the attainment of sustainable IS/IT-based competitive advantage relies on a process of building organizational infrastructure in order to enable strategies. They support the view that only IS management skills are likely to be a source of sustained advantage and that organisations must focus less on IT per se, and more on the process of organising and managing IT (Ward and Peppard, 2002, p.53-57). The most important challenges and opportunities presented by electronic commerce are managerial rather than technical (Saloner & Spence, 2002, p.v). These models are useful, as different governance mechanisms will be more important to different eras.

Gottschalk (2004, p.251-254) noted that some IT functions in the same organisation might be categorized in the different stages. IT functions in the first stage may be considered for outsourcing, but functions in the later stages, when IT functions become of strategic importance, outsourcing is no longer an option.

3.9. Conclusion

This chapter served as an introduction to the discipline of IT governance and the importance of IT governance was motivated. IT governance can be regarded as an extension of enterprise governance, the management of information and information related resources in a way similar to what human resources and other assets in an organization will be managed. It was also argued that the IT function can be regarded as a business inside a business, with governance structures and principles functioning in this business in a business. Another perspective of IT governance that was highlighted is that IT is an asset which permeates the entire organisation, and that the governance of that resource entails defining the mechanisms that will control who makes what decisions, and how to obtain assurance that business value will be created and protected. In this chapter it was highlighted that the role of the IT organisation is to support the strategic direction of the organisation that it supports. Strategic alignment of the IT function can only really be addressed if the strategic direction of the parent organisation is clear. Good IT governance is thus dependant on good institutional governance, where the goals and direction of the organisation is clearly defined and communicated. Good IT governance, as a component of overall enterprise governance, is therefore also a good indicator of good enterprise governance. The conclusion that good IT governance can be regarded as a more important success factor for value creation in an organisation than the technology or the IT resources itself was motivated from the literature. Organisational structures remain one of the important mechanisms for IT governance, and the role of committees in IT governance was discussed. The trend of outsourcing, delegating some decisions to an external party, has obvious governance implications, and some aspects of outsourcing were highlighted. The applications portfolio matrix was identified as a valuable tool to support outsourcing decisions.

The historic perspective of the development of the IT governance discipline from facilities management, to service management to IT governance is useful. With this

perspective, not only the distinction, but also the interdependence, between IT management and IT governance becomes clearer. In the following chapter, the historic perspective will also be used to establish the relationship between different IT governance frameworks.

The evolving role of IT in the organisation required different perspectives of management, and was supported by different sets of best practice standards or frameworks. Some of these frameworks are discussed in the next chapter.

frame·work *(frām'wûrk')*
n.
1. *A structure for supporting or enclosing something else, especially a skeletal support used as the basis for something being constructed.*
2. *An external work platform; a scaffold.*
3. *A fundamental structure, as for a written work.*
4. *A set of assumptions, concepts, values, and practices that constitutes a way of viewing reality.*

(http://ie.thefreedictionary.com/framework)

Chapter 4. IT Governance Frameworks

4.1. Introduction.

In the previous chapter the discipline of IT governance was introduced and the importance of IT governance in the overall enterprise governance was established. The conclusion that was made is that IT governance builds on the best practices laid by the earlier emphasis of IT organisations on infrastructure management and service management. Each of these views of the IT function led to a set of best practice standards or frameworks that support IT decision-making. In this chapter the concept of a framework in general is described. The value of IT governance frameworks will be argued. Several IT governance frameworks are then introduced, and an attempt is made to place these "best practice" frameworks in perspective and to establish the link between them. The main features of different IT governance frameworks will be highlighted with a view to support decisions regarding which frameworks will be appropriate under what circumstances and to establish how the different frameworks relate to each other. In the following chapter the desirable characteristics of a suitable IT governance framework for use in HE in South Africa will be discussed and motivated, based on some of the governance frameworks discussed and the best practice for IT that will be discussed in this chapter.

4.2. What is an IT Governance Framework?

For the purpose of discussing frameworks in IT governance, a broad view of what is meant with a framework shall be adopted. A framework provides the boundaries, a set of principles and guidelines, which provide a vision, a philosophical base and an organisational structure for construction. A framework should provide the basic structure that is customizable for application within a specific environment.

IT Governance frameworks are based on generally accepted practice. The IT Governance Institute, for example, specifically states that "COBIT was originally based on ISACF's *Control Objectives*" and that it has been enhanced with existing and emerging international technical, professional, regulatory and industry-specific standards. The term "generally applicable and accepted" is explicitly used by the IT Governance Institute in the same sense as Generally Accepted Accounting Principles (GAAP) (IT Governance Institute, 2000c, p.11). A Best practice approach is based on making observations about others that have been successful in performing certain tasks or processes. It is about learning from others and implementing what has been shown to work. Best practice is a documented proven process.

4.3. Benefits associated with Best Practice Frameworks

Mingay and Govekar (2002, p.1-2) discusses the effect of BS15000, one of the latest standards on IT service management, and some of the benefits to different stakeholders.

Benefits for the industry include:

- Common vocabulary and service metrics
- Improved consistency in the quality of service through adoption of best practice.
- Reduced training Costs
- Easier interchangeability of service staff and service providers

Benefits for the end-user organisation include:

- It serves as a baseline against which the quality of the IT service management can be measured.
- Reduced risk if external service providers comply with accepted standards of governance.
- Serves as a mechanism to handle complexity in a diverse computing environment

Similar benefits can be identified that can be derived from the implementation of other frameworks such as CobiT. The IT Governance Institute (2000, p.8-10) mentions some of the benefits of using the CobiT Framework:

- Management must decide on the level of risk pertaining to IT that they are willing to accept, but this may be very difficult to do. A framework of generally accepted IT security and control practices to benchmark existing and planned practices facilitates decision-making.

- Users of the IT systems need assurance that adequate security and control are exercised over the IT assets. This assurance is usually derived from accreditation or third party audits. An IT governance framework, such as CobiT, provides a foundation, as a first step, after which accreditation from other bodies can be sought.

- Auditors find it very difficult to substantiate their opinion on internal control in the absence of an internationally accepted framework.

A valid control system can assure that policies are being carried out as required and warn the central decision-making function of changes that require a new set of policies or commands (Page, 1998, p.4). A high level governance framework such as CobiT provides a coherent set of policies which represent industry best practice.

Several studies have shown that the application of quality principles such as the process of continuous improvement can lead to benefits such as business excellence and competitive advantage (Stephens, 2000, p.2). The frameworks that will be discussed below typically include processes based on continuous improvement.

4.4. Frameworks for IT Governance

A number of frameworks, or best practice recommendations and standards are in general use. Because these frameworks are based on generally accepted good practice, it can be expected that a measure of overlap between these frameworks will exist. Some of the most important toolsets used for IT Governance are: CobiT, ITIL, BS1500, BS 7799, and COSO. These are briefly discussed below. The relationship between IT governance best practice recommendations such as CobiT, Standards Organisation's BS7799-1:1999 document (British Standards Organisation, 1999),

ITIL and BS15000 (British Standards Organisation, 2002) will be established. CobiT and ITIL can be seen as some of the broadest and most widely used frameworks for IT governance, and that is why it is appropriate to describe these frameworks in some detail first, and then how the other frameworks relate to the above.

4.4.1. CobiT (Control Objectives for Information and related Technology)

CobiT is an open standard for IT governance now in its third edition. The standard is supported by a family of CobiT products. The set of publications is available from the Information Systems and Control Association (ISACA). ISACA is an international professional, technical and educational organization with members in more than 100 countries. ISACA and the associated research organization, ISACF (Information Systems Audit and Control Foundation), founded the IT Governance Institute (ITGI) in 1998. The ITGI strives to expand awareness of the need for, and benefits of effective IT governance. Since release of the third edition of CobiT, ITGI has become the primary publisher of the framework (IT Governance Institute, 2000a, p.18).

CobiT is a distillation of global best practice from a wide range of sources including (IT Governance Institute, 2000a, p.18):

- Technical standards such as ISO and EDIFACT
- Codes of Conduct issued by the Council of Europe, OECD, ISACA
- Qualification criteria for IT systems and processes: ITSEC, TCSEC, ISO 9000, SPICE, Tickl, Common Criteria
- Professional standards for internal control and auditing: COSO, IFAC, AICPA, CICA, ISACA, IIA, PCIE, GOA.

One of the features of CobiT is that it has a strong business orientation (Lainhart, 2000, p.21). The basic premise that the framework starts with is: “In order to provide the information that the organisation needs to achieve its objectives, IT resources need to be managed by set of naturally grouped processes” (Lainhart, 2000, p.22; IT Governance Institute, 2000a, p.13). The CobiT conceptual framework can thus be

seen as having three dimensions viz information criteria; IT resources; and IT processes.

The information that the organisation needs, must conform to certain criteria, which CobiT (IT Governance institute, 2000a, p.13) refers to as business requirements for information. In establishing the business requirements for information, CobiT (IT Governance Institute, 2000a, p.13) claims to have embedded the principles of known quality and security reference models, and for the fiduciary requirements referred to the COSO definitions. The CobiT (IT Governance Institute, 2000a, p.14) business requirements for information include:

- Effectiveness which include the requirements for relevance and pertinence to the business process. Effectiveness also requires delivery of the information in a timely, correct, consistent and useable manner.

- Efficiency, which is about the provision of information through the most productive and economical use of resources.

- Confidentiality which refers to the protection of information from unauthorized disclosure.

- Integrity which relates to the accuracy and completeness of the information as well as to its validity in accordance with business values and expectations.

- Availability relates to information being available when required by a business process.

- Compliance deals with complying with laws, regulations and contractual arrangements.

- Reliability.

CobiT (IT Governance Institute, 2000d, p.14) defines five categories of resources that must be managed to deliver the information required:

- Data. The term is used in its widest sense to refer to data objects internal and external, structured and non-structured, graphics sound etc.

- Application Systems are described as the sum of manual and programmed procedures.

- Technology is used to refer to hardware, operating systems, networking, multimedia etc.

- Facilities are all the resources used to support the information systems.

- People resources "include staff skills, awareness and productivity to plan, organise, acquire, deliver, support and monitor information systems and services".

CobiT groups IT processes in four broad categories referred to as domains:

- Planning and organisation. This category covers strategy, tactics, and the ways that IT can best contribute to the business objectives. It includes planning for proper organisation and technological infrastructure.

- Acquisition and implementation – deals with identifying and implementing IT solutions. Changes and maintenance of existing systems are also covered in this category of processes.

- Delivery and support covers the delivery of services as well as data processing by application systems.

- Monitoring processes include internal and external auditing, quality assurance and compliance issues.

Processes consist of activities and tasks. CobiT defines high-level control objectives for these processes, and then more detailed control objectives for each of the high-level control objectives. An IT control objective is a statement of the desired result or purpose to be achieved by implementing control procedures within a particular IT activity (Lainhart, 2000, p21; IT Governance Institute, 2000a, p.16). Altogether 34 high-level processes with their associated control objectives are identified by the CobiT framework. Altogether 318 detail control objectives support the high-level objectives (IT Governance Institute, 2000, p.5). The IT Governance Institute depicts the IT processes within the four domains as in Figure 4.1. below (IT Governance Institute, 2000, p.7):

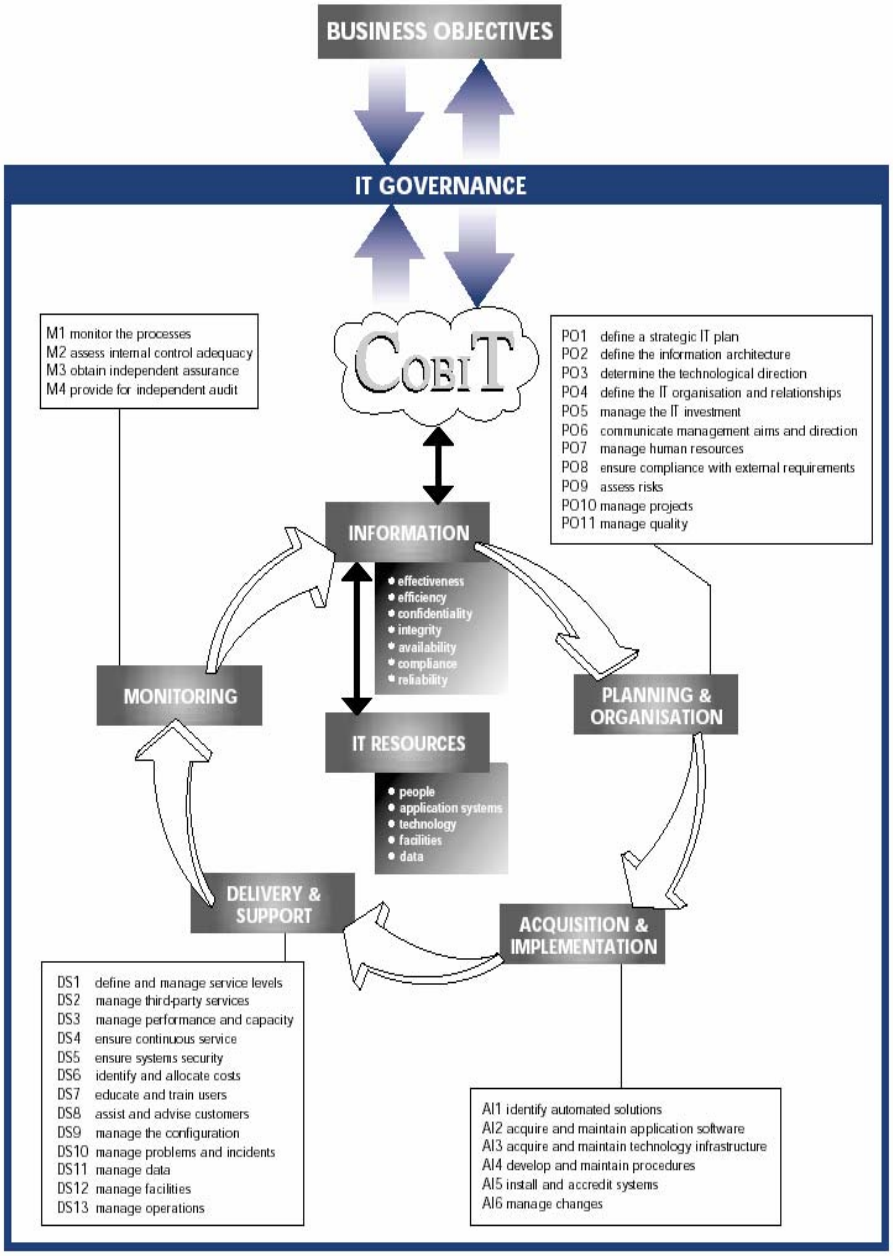

Figure 4.1. CobiT IT Processes Defined Within Four Domains (CobiT, 2000, p.7)

The CobiT framework is supported by a family of products, including: Executive summary (IT Governance Institute, 2000c, p.1-15); Management Guidelines (IT Governance Institute, 2000e, p.1-122); Framework (IT Governance Institute, 200d, p.1-68); and an implementation toolset which includes case studies, frequently asked questions, and an implementation guide (IT governance Institute, 2000d, p.19).

The CobiT Management Guidelines (IT Governance Institute, 2000e, 122pp) include maturity models, critical success factors, key goal indicators and key performance indicators for each of the 34 high-level controls. CobiT refers to Key Goal Indicators as 'LAG' indicators, as they can only be measured after the fact, and to Key Performance Indicators which as 'LEAD' indicators giving an indication of success before the fact (IT Governance Institute, 2000e, p.19). The maturity models are used to assist the institution to evaluate its level of maturity, and to compare it against industry norms.

The framework is comprehensive, but can be described as above the level of a technical specification. IT governance framework is a fitting description for CobiT. CobiT control objectives have been defined in a generic way, in the sense that it is not dependent on a specific platform. CobiT does, however, state that some technology environments may need separate coverage for Control Objectives (IT Governance Institute, 2000d, p.21). This is an indication of the value of, for example, the Microsoft Operations Framework which will be discussed later.

The CobiT framework is broad and covers all aspects of information and the technology that supports it (Lainhart, 2000, p.22). CobiT is achieving worldwide recognition as the authoritative source for IT Governance. It is widely used by boards of directors, business process owners (Lainhart, 2000, p.21), auditors and audit committees, management, heads of governmental organisations and security managers (Lainhart, 2000, p.22). The CobiT products are constantly evolving through further research and development (IT Governance Institute, 200a, p.19), and it can thus be expected to have a major impact on the development of the IT governance discipline.

4.4.2. ITIL

The IT Infrastructure Library (ITIL) was developed by the Central Computer and Telecommunications Agency, a UK Government agency, now known as the Office of Government Commerce (OCG) and is supported by the IT Service Management Forum (itSMF) (Sallé, 2004, p.10). ITIL is a comprehensive and coherent code of practice to help organizations provide efficient and cost-effective IT services. It is not a formal national or international standard such as, for example, BS7799 or BS15000 (Mingay and Govekar, 2002, p.1). It is, however, widely used, and can be

regarded as a de facto standard for service management. It consists of a series of documents that are used to aid the implementation of a framework for IT Service Management (ITSM). The library consists of some 40 volumes in six sets viz service support; service delivery; planning to implement service management; IT infrastructure management; applications management; the business perspective (Pultorak, 2002, p.14-15). The ITIL Key Areas can be depicted as in figure 4.2. below. The areas shaded in dark grey are currently available, and the light grey area refers to a future module. Security management is not dealt with as a separate issue, but integrated in all the other modules (Sallé, 2004, p.11):

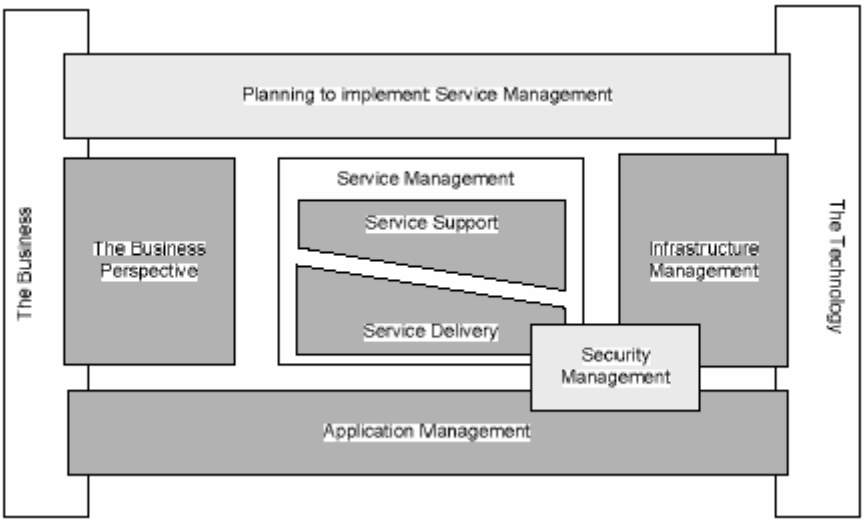

Figure 4.2. ITIL Service Management Solution (Sallé, 2004, p.11)

The main focus of ITIL has been on service management, which is separated into two main areas, Service Support and Service Delivery. The services are dependant on a well managed infrastructure to deliver business value. Business application management is dealt with as an area requiring special attention.

The two main objectives of ITIL are to create comprehensive, consistent and coherent codes of best practice for quality IT service management promoting business effectiveness in the use of IT and to encourage the private sector to develop ITIL-related services and products (training, consultancy and tools) (Pultorak, 2002, p.1).

The ITIL and Microsoft frameworks (described later in this chapter) use a set of specialized terminology which are key concepts in the frameworks (Microsoft Corporation, 2002b, p4; Microsoft Corporation, 2002c, p.8):

- Service solutions. The capabilities that IT provides to the organization. Examples include messaging, line of business applications (LoB applications), data storage, Web services, e-commerce, information publishing, knowledge management and printing.

- Release. A group of changes that the operations team introduces as a unit into the production environment. Each release has its own life cycle. A release may be, for example, a new or updated line-of-business (LOB) system, a new or updated Web site, new hardware (server, network), an updated operations processes or procedures or changes in communication processes or team structures. This broad definition of release supports the fundamental principle of managing changes in people, process, and technology in the provision of service solutions (Microsoft Corporation, 2002c, p.16).

- IT service management. "The concept of applying a structured set of processes to ensure the quality of mission-critical IT services to meet levels of service agreed to with the customer."

- Service management functions (SMFs). Twenty processes have been identified that are common to most service solutions and that take place during a release. Examples include change management, release management, service desk, capacity management and security administration. Each service management function provide consistent policies, procedures, standards and best practices that can be applied to the entire suite of service solutions found in IT environments.

The two most popular key areas (out of the key areas as depicted in figure 4.2) in ITIL are service support and service delivery. The five disciplines of the ITIL Service Support area are Release Management, Configuration Management, Incident Management, Problem Management and Change Management. The five disciplines of the ITIL Service Delivery are Service Level Management, Capacity Management,

Availability Management, IT Continuity Management and Financial Management (Sallé, 2004, p.11-13).

ITIL has been adopted by a number of very high profile IT companies as the best practice standard for the provision and management of IT services (Microsoft, 2002b, p2; Sallé, 2004, p.10). Any IS organization endeavoring to implement or improve Service Level Management (SLM) and Service Level Agreements (SLAs) must do so within the context of an integrated framework, and according to Mingay and Govekar, ITIL is the "clear and obvious choice" (Mingay and Govekar, 2002, p.2).

4.4.3. Microsoft Enterprise Services (ES) Frameworks

Microsoft distinguishes four phases within the IT development life cycle: planning, preparing, building, and operating.

- Planning. Identifying business needs, technologies, and solution options to align business and IT plans.
- Preparing. Developing the organizational readiness and individual skills needed to implement new technologies.
- Building. Designing, developing, and deploying systems rapidly and efficiently.
- Operating. Implementing repeatable processes, procedures, and customized support options to run highly available, scalable, reliable, and manageable systems.

Microsoft Corporation provides guidance in the form of white papers, operations guides, assessment tools, best practices, case studies, templates, support tools, courseware, and services to maximize the success of IT projects. This guidance addresses the people, process, technology, and management issues pertaining to complex, distributed, and heterogeneous technology environments. The guidance is organized into two "well integrated bodies of knowledge, or frameworks" (Microsoft, 2002b, p.1). These are Microsoft Operations Framework (MOF) and Microsoft Solutions Framework (MSF).

Microsoft created MOF by building on top of ITIL's best practice (Microsoft Corporation, 2002b, p.3). MSF and MOF share foundational principles and core disciplines. In MSF, the emphasis is on projects, and in MOF, it is on running the production environment. MSF and MOF provide an interface between the solution development domain and the solution operations domain. The MOF and MSF will individually be described below. These Frameworks are described in some detail, because it covers and extends the ITIL and BS15000 frameworks, and because of the indisputable impact that the Microsoft technologies have in the global IT arena.

4.4.3.1. Microsoft Operations Framework

MOF provides guidance that enables organizations to achieve mission critical system reliability, availability, supportability and manageability of IT solutions built with Microsoft products and technologies (Microsoft Corporation, 2002b, p.1). The guidance covers the people, processes, technology and management issues pertaining to operating complex, distributed, heterogeneous IT environments on an ongoing basis as an IT service (Microsoft Corporation, 2002b, p.1-2). This is clearly of great value and interest to the entire organisation, as most modern organisations are dependant on these systems.

MOF was designed to meet the following goals (Microsoft Corporation, 2002b, p.3):

- Use ideas that have been proven in action.
- Leverage industry best practice (including ITIL).
- Provide an extensible foundation for operations knowledge.
- Address people, process and technology.
- Increase IT's agility so that the business can rapidly adjust to changing conditions.
- Integrate with MSF to manage other parts of the IT life cycle.
- Managing end-to-end services (including processes and procedures), not just servers and technology.

From the above, the position of MOF as an important component in the governance environment can be seen.

MOF consists of three models: The Process Model, The Team Model, and The Risk Model (Microsoft Corporation, 2002b, p.3). As was highlighted in previous chapters, these are also the main areas of concern in IT governance i.e. the effectiveness and efficiency of processes that add value to the organisation, the organizational structures that determine allocation of responsibility and accountability to people and teams, and the need to manage risk.

The MOF Process Model.

The MOF process model provides a simplified, generalized way to think about the processes that operations teams perform in a complex IT environment (Microsoft Corporation, 2002b, p.3). This is clearly of great value to managers responsible for directing the business processes. A group of related changes in the IT environment is termed a "release", and the MOF describes a life cycle that affects releases of any magnitude.

The MOF process model is based on four guiding principles (Microsoft Corporation, 2002b, p.4):

- Structured Architecture. All operational activities are structured as part of the MOF to decrease complexity.

- Rapid life cycle, iterative improvement. The concept of an iterative life cycle is used to support rapid change in response to changing business needs. The process incorporated continuous assessment and improvement of the operating environment. This is an essential process in quality management.

- Review-driven management. The process model includes reviews at key where top management involvement is appropriate. This clearly facilitates the monitoring and control function in IT governance.

- Embedded risk management. Risk management in continuous operations is crucial to ensure that IT does not fail the business.

The MOF process model classifies the IT processes into four categories ("quadrants") in a "life cycle" that affects all "releases" as follows: changing; operating; supporting; and optimising. This has some resemblance to the CobiT process categories which are correspondingly: acquisition and implementation; delivery and support; monitoring; and planning and organization. (Lainhart, 2000, p21; IT Governance Institute, 2000a, p16; Microsoft Corporation, 2002b, p.5).

The set of twenty generic processes termed SMFs (service management functions) are common to a "release" in almost all service solutions (for example a messaging service, or a line of business application). The processes, categorized in the four quadrants, along with the management checkpoints are depicted as in figure 4.3. from the Microsoft Operations framework documentation (Microsoft Corporation, 2002c, p.14):

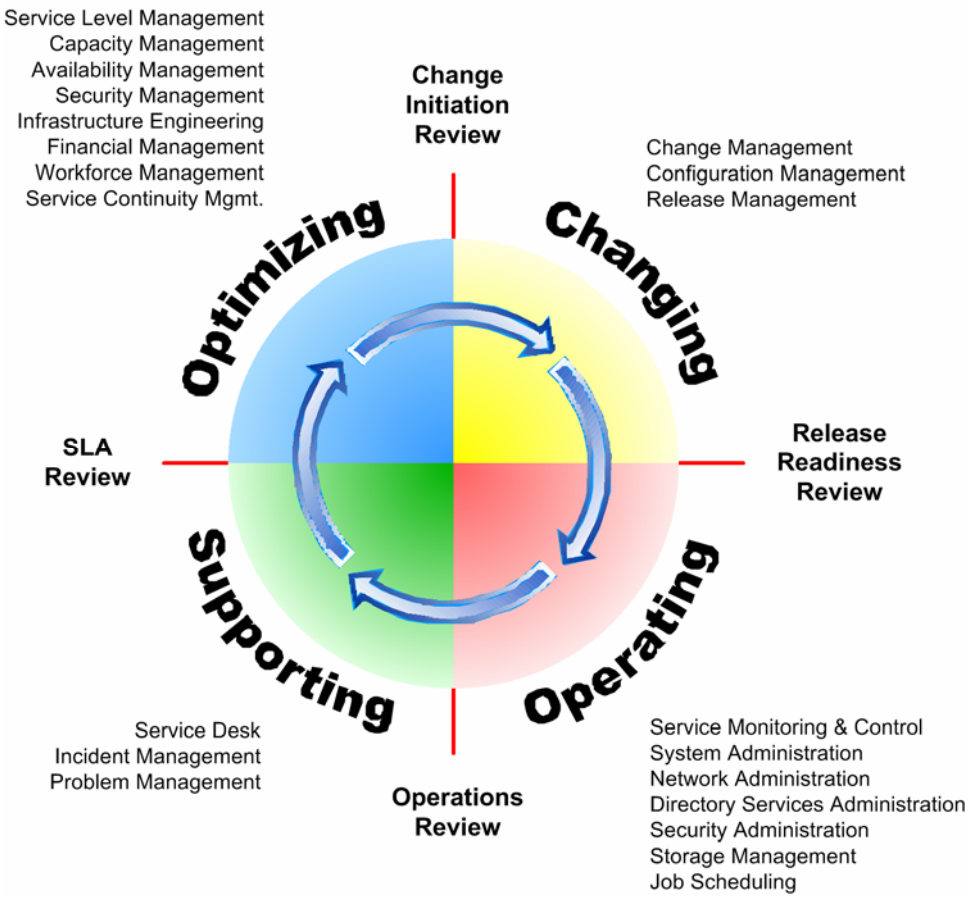

Figure 4.3. Microsoft Operations Framework – Process Model (Microsoft Corporation, 2002c, p.14).

As an example of what the different quadrants of the model entail, a brief description of the change quadrant follows. A change could be as simple as a security patch to an operating system (an operational matter), to the deployment of a new version of an integrated business system that will likely have massive financial and business process implications to the business, and which is clearly a matter that must be approved at board level. In the change quadrant of the MOF process model, service management functions (SMFs) or process guidelines include the change management SMF, the configuration management SMF and the release management SMF. The change management SMF recommends controls that are commensurate with the complexity, risk, cost and impact of the release under consideration. These controls can range from automated approvals to full project reviews at any level of the governance structure. Requests for change can be formalized with descriptions of the change, components affected, business need, cost estimates, risk assessment, resource requirements, and approval status. Recommendations are made concerning structures such as "change advisory boards", responsible for reviewing proposals and making recommendations (Microsoft Corporation, 2002c, p25

An example of a review point in the MOF process model is the "operations review." The primary goal of the operations review is to assess the effectiveness of internal operating processes and procedures and make improvements as appropriate (Microsoft Corporation, 2002c, p.25).

The Microsoft documentation mentions specifically that the recommendations are at "foundation level", and may have to be adapted in specific operational environments, considering factors such as business needs, cost, organizational maturity and risk tolerance of the organization (Microsoft Corporation, 2002c, p.15).

The MOF Team Model.

These models are of value in the study of IT governance to address the key question of IT governance: Who makes what decisions, how are the decisions made, and how is assurance obtained that the decisions are implemented? The MOF team model builds on ITIL's best practices for organizational structure and process ownership. A delicate balance exists in suggesting process ownership and functional organization. For example, change management ownership crosses geographical, business unit, time zone, and even company boundaries, and it is therefore very difficult to assign

responsibility to any one person or group. Organizational models are closely tied to the processes used within them. The process responsibilities must often be shared, and that is why it is key to adopt standard best practices (such as ITIL and MOF) throughout the industry for guidance on how to accomplish such processes (Microsoft Corporation, 2002d, p.9). The MOF team model describes amongst others: best practice role clusters to structure operations teams; the key activities and competencies of each role cluster; how to scale the teams for different sizes and types of organizations; which roles can be effectively combined; guiding principles that help run and operate and maintain distributed computing environments on the Microsoft platform; and how the MOF team model relates to the MSF team model.

The five primary principles and guidelines for the MOF team model are (Microsoft Corporation, 2002d, p.13): providing great customer service; understanding the business priorities and enabling IT to add business value; building strong, synergistic virtual teams; leveraging IT automation and knowledge management tools; attracting, developing, and keeping strong IT operations staff.

The MOF team model thus provides guidance in the areas of IT staff management that is of prime importance to the governance of IT such as stakeholder interests addressed, effectiveness of the HR resource, efficiency through automation and continuity in the HR area.

In this area (of role and team definitions) the Microsoft frameworks, MOF and SMF, offer a different and more detailed perspective than any of the other frameworks. The MOF team model by design functions as a virtual team working in interdependent, multidisciplinary roles (Microsoft Corporation, 2002d, p.15). This has implications on the way that the teams are managed and control is exercised. Standards and trust become very important in this environment. The Team Model documentation emphasizes that a vital component of a virtual team is the ability for each role to depend on and trust in the other roles to fulfill their responsibilities to keep the systems running. This trust develops through a blend of culture, good management, and time spent working together. If mistakes cause downtime or lost business, no one person or role is at fault. Rather, it will be the responsibility of the collective virtual team to correct the error and restore the system as quickly as possible (Microsoft Corporation, 2002d, p.15). Responsibilities and quality is thus

governed by these self-regulating teams. This approach to the governance responsibility to assign responsibility and accountability for decisions and control is quite different from the traditional strictly hierarchical organisation structures that attempts to assign responsibility and accountability to a specific manager. It follows that this approach will not work well in all organizational cultures.

The MOF and MSF Risk Models

Microsoft claims that the MOF risk model has greater value than many of the other risk models because it combines key principles with a customized terminology in a five-step repeatable and structured process, and it is integrated in the larger operations and solutions framework (Microsoft Corporation, 2002b, p.17). The framework is comprehensive and deals with all the elements in an IT project, including people, process and technology elements. The risk model has a pro-active orientation and it is flexible, allowing for it to be used in conjunction with a range of risk analysis methodologies (Microsoft Corporation, 2002i, p.3). The model places a lot of emphasis on learning during the process of managing for risk, through mechanisms such as a risk knowledge base, and developing a risk management culture, where risk management does not just become an automatic process, but where teams actually apply their minds to think about risks. In this regard techniques such as root cause analysis is put forward as one of the best practice techniques (Microsoft Corporation, 20021, p.32-35)

A few key principles from the MOF and MSF risk model are highlighted (Microsoft Corporation, 2002b, p.18):

- Continuous risk assessment which means that the team continuously searches for new risks, and existing risks are periodically reevaluated.

- Risk management is integrated in every role and function. This means that the responsibility for risk management is shared and every IT process is designed with risk management in mind.

- Risk identification must be treated positively, without fear of retribution or criticism.

- Establish a level of formality and process discipline that the teams can understand and use.

The MOF risk management model is based on a five-step process model, which is depicted by Microsoft as in Figure 4.4. (Microsoft Corporation, 2002b, p.14):

Figure 4.4. MOF Risk Management Process Model.

The steps as indicated in the graphic model above are:

- Identify. The source of the risk (using any of a number of risk taxonomies and methodologies), the mode of failure, condition, operational consequence and business consequence is determined.

- Analyse. The probability and impact rating (using any of a number of techniques presented) is described and ranked.

- Plan. This includes identifying appropriate risk strategies (avoidance, mitigation, transfer or acceptance), triggers and defining contingency plans.

- Track how various elements of risk are changing over time.

- Control refers to the execution of planned reaction to certain events.

Both the MOF risk model and the MSF risk model white papers (Microsoft Corporation, 2002e; Microsoft corporation, 2002i) contain less than sixty pages, but

best practice risk management elements are found in many other parts of the MOF and MSF documentation, such as the windows operations guide series referred to in the next section.

4.4.3.2. Microsoft Solutions Framework (MSF)

Whereas the MOF, discussed in the previous section, deals with the service support key area of ITIL, the MSF deals with the key area of developing and implementing business solutions. Creating a business solution on time and within budget requires a proven approach, and the purpose of the MSF is to provide proven practices for planning, designing, developing and deploying successful IT solutions. The MSF consists of principles, models, disciplines, guidelines and practices for managing the people, process, technology elements of IT projects. The framework includes the MSF process model, the MSF team model, MSF project management discipline, the MSF risk management discipline and the MSF readiness management discipline. The objectives of the framework are typical IT governance objectives and include improving quality, reducing risk and deriving maximum business benefit from IT solutions. The MSF framework is flexible and can be applied to software development projects, infrastructure deployment projects and packaged application integration projects (including enterprise resource planning). MSF has been developing since its first introduction in 1994, and can thus be considered as a mature and valuable framework. (Microsoft Corporation, 2002f, p2; Microsoft Corporation, 2003, p.4-10, 24).

A considerable overlap in the concepts, practices and procedures of MSF and MOF can be found. The two frameworks are well integrated. MSF has a solution delivery, or a development perspective, while MOF has a service management, or an ongoing operations perspective.

The eight “foundation principles” of the MSF (Microsoft Corporation, 2003, p.9-16) have commonality with many governance frameworks. The first principle “foster open communications” proposes an open and inclusive approach to communications within the teams and with key stakeholders. The second principle, “work toward a shared vision”, involves a team and business understanding of how this solution will add business value. The third principle is to “empower team members.” This extends the concept of responsibility and accountability with the concept of

commitment. Commitment is due to the team, and can be expected from other team members. The team members hold themselves and each other accountable to meet the objectives of the project. Monitoring is distributed across the team and becomes a supportive rather than a policing activity. This approach to monitoring is quite different from the approach that one would expect from a group strongly influenced by auditors. The fourth principle is to "establish clear accountability and shared responsibility." The observation is made that failure to establish clearly understood lines of accountability and responsibility on projects often lead to inefficiency and project failure. A key governance concept in the MSF is that each team member is accountable to the team itself and to the stakeholders for the role's quality goal. Note that a person may play a role in one team, and a completely different role in another team. It is argued that responsibility must be shared, because failure of any role could lead to the failure of the project. Microsoft refers to "the well documented and exhaustive study performed by Larson and La Fasto" where the success of cross-functional teams that have clear accountability and shared responsibility was established (Microsoft Corporation, 2003, p.12). The fifth principle is to "focus on delivering business value." The recommendations include developing a culture of business-mindedness, and structuring the teams with a strong multi-dimensional business representation. The sixth principle is to "stay agile and expect change." The emphasis is on using processes that are able to adapt to changing business needs. It corresponds to King's comments (IoD, 2002b, p.19) on the need to balance performance (entrepreneurship) with conformance by recognizing that sometimes the original specifications must be adapted to meet changing needs. The seventh principle is to "invest in quality" and the eighth principle is to "learn from all experiences (Microsoft Corporation, 2003, p.14-16). The last two principles are supported by processes, tools and techniques with the objective to obtain continuous improvement of effectiveness and efficiency.

The MSF Process Model

The MSF process model is characterized by:

- A phased and milestone based approach. Milestones are used to plan and monitor project progress. This provides control points for management intervention. The milestones are points in the project where project progress

is formally evaluated by the team, the stakeholders and the project sponsor (Microsoft Corporation, 2002f, p.15-17).

- An iterative approach. This approach facilitates stepwise improvement of the product. Aspects of quality, security, base lining and change control are addressed in the process model (Microsoft Corporation, 2002f, p.17-20).

- An integrated view of development and deployment. The focus of the MSF is to produce business value. The position is taken that a solution is only complete when value is actually delivered, which is only once the solution is implemented. The MSF addresses the handover of the solution from development to operations (Microsoft Corporation, 2002f, p.20-23).

The MSF Team Model

The MSF team model describes role clusters that are appropriate to a development environment, which differs significantly from the role clusters described in the MOF. The MSF team model will not be described here, but it can be noted that the model is similar in its approach to the MOF in allocating responsibility and accountability to roles in a team of peers working on a solution that must add value to the business. It must be noted that the MSF team model describes key roles and responsibilities for a project team, but does not define the management structure of the team from a personnel administration perspective (Microsoft Corporation, 2002k, p.1-44).

MSF Disciplines

MSF refers to areas of non-technology expertise that are important competencies of all the roles in the MSF team model as disciplines. Currently, MSF has addressed three disciplines. These are risk management, readiness management, and project management (Microsoft Corporation, 2002g, p.7). The MSF disciplines allow for a resource-based view of the firm. The resource-based perspective of the firm has gained increasing prominence in the last few years. The resource based perspective means that the organization is regarded as essentially a bundle of resources. With this view the task for management is to integrate and coordinate these resources to create organization-specific competencies. In the case of ICT, the primary resources are intangible, the knowledge and skills of staff, as well as the processes, structure

and culture of the IT function. It follows then that, when IT fulfills a strategic role in a organisation, the business must develop and maintain a high level of competency in how it manages and uses IT resources (Ward and Peppard, 2002, p.384-397). The MSF best practice recommendations in the readiness management discipline, the risk management discipline and the project management disciplines thus make a valuable contribution to the overall IT governance body of knowledge, or framework.

The MSF Readiness Management Discipline.

Kaplan and Norton liken strategic readiness to financial liquidity. Measures of strategic readiness give an indication of how well the organisation can respond to demands from the business. They stress that strategic readiness is a necessary, but not sufficient, condition for strategic success (Kaplan and Norton, 2004, p.213).

Microsoft (Microsoft Corporation, 2002h, p.4) describes the readiness management discipline as the discipline that outlines an approach for managing of the knowledge, skills and abilities needed to plan, build and manage successful solutions. This discipline also provides a plan for following a readiness management process. Together with proven practices, this discipline provides a foundation for individuals and project teams to manage readiness within their organizations.

The discipline imposed by focusing on readiness from an organizational, technology and capability perspective is important from a governance perspective, as it can assist the organisation to avoid losses. Many IT initiatives may be based on excellent concepts, but an organisation may not have the necessary capability to exploit the opportunity.

The MSF Project Management Discipline.

IT initiatives are commonly proposed to top management or the board at a project level, and managing the IT project portfolio is key to managing the IT function in an organisation (Ward and Peppard, 2002, p.438-440).

One of the notable characteristics of MSF is the absence of a role or job title called project manager. Responsibility for project management is distributed to team leads. Project management specialists provide an approach which is based on facilitation and coaching, rather than imposing control on the rest of the team. The MSF Team

Model is based on the premise that each role presents a unique perspective on the project and that the MSF team roles share responsibility for many aspects of project management, such as risk management, time management, quality management, planning, scheduling, team recruitment, and human resource management. In the MSF, the term project management is used to refer to a set of knowledge and skill areas as mentioned above. The term project manager is used in MSF to refer to a person who is a specialist in project management. The MSF project management discipline does not attempt to cover the entire generic project management discipline, but makes specific recommendations regarding the application of the discipline in the IT project management area (Microsoft Corporation, 2002g, p.5-9). The MSF project management discipline draws on, and can be used in conjunction with any of the project management frameworks such as the Project Management Institute (PMI) project management body of knowledge (PMBOK) (Project Management Institute, 1996) or the Office of Government Commerce's PRINCE2, a UK Government standard for IT project management (OGC, 2004).

4.4.3.3. Windows Operations Guide Series.

Microsoft Corporation has developed a set of guides that draws from best practice guidelines documented in the Information Technology Infrastructure Library (ITIL) and from IT operations experience by Accenture, Avanade, Compaq Global Services, Hewlett-Packard Company, International Network Services, Compuware Corporation, Unisys Corporation, Microsoft Consulting Services (MCS), and the Microsoft Information Technology Group (ITG). The guide series provides operational guidance based on ITIL, but tailored for Microsoft technologies. It provides conceptual information, best practices, and detailed procedures. The documents are referred to as the Windows Operations Guide Series. It is aimed primarily at two main groups: information technology (IT) managers and IT support staff (Microsoft Corporation, 2002j, p.1). These documents provide more detailed information and best practice guidelines for specific areas, using MOF and ITIL principles. As will be noted from the titles and descriptions of the guides, there is an almost one-to one mapping of these guides to the ITIL processes described in a previous section. An indication of some of the guides available is given below:

- Availability Management Operations Guide. How to ensure that services are available and that service disruptions are minimized.

- Capacity Management Operations Guide. Deals with how to ensure that appropriate IT resources are available to meet evolving business needs on time and at minimum cost.

- Change Management Operations Guide. The guide covers conceptual knowledge, best practices, and detailed procedures related to change management process in a Microsoft Technology environment.

- Configuration Management Operations Guide. The document provides best practice guidelines on how to ensure that all changes to configuration items are recorded and tracked through their component lifecycle. This is essential for an effective information security program. It further supports the wise use of expensive resources.

- Directory Services Administration Operations Guide. The guide covers conceptual knowledge, best practices, and detailed procedures related to directory services administration. This addresses the authentication and authorization aspects of information security.

- Financial Management Operations Guide. The guide covers the expense and cost side of what is needed to make business decisions regarding changes in the IT infrastructure, systems, staffing, or processes. Budgeting is an important IT governance mechanism (Weill and Ross, 2004, p.5).

- Incident Management Operations Guide. This document provides information on how to deal with faults and disruptions in the use or implementation of IT services as reported by customers or IT partners. This function is important to ensure that the customers receive a high standard of support, and to ensure continuous improvement of services.

- Network Administration Operations Guide. Provides best practice guidelines on how to manage the physical network in the organization, and addresses the areas of responsibility in the daily administration of a Network Operations Center.

- Problem Management Operations Guide. Deals with how to investigate and resolve the root causes of IT service incidents, faults, and disruptions.

- Print and Output Management Operations Guide. Deals with how to manage data that is printed or compiled into reports that are distributed to various members of the organization. The purpose is to ensure that any sensitive printed material is properly secured.

- Release Management Operations Guide. Covers conceptual knowledge, best practices, and detailed procedures related to the release management process. A release could imply the implementation of a large integrated system in an organisation, exposing the organisation to a high risk. Top managers, and even the board could be involved in such high impact deployments.

- Security Administration Operations Guide. Security is an important part of system infrastructure, and this document provides guidance on how to secure a network and ensure data confidentiality, data integrity, and data availability.

- Service Continuity Management Operations Guide. This document deals with aspects of disaster recovery, and safeguarding the existing systems by the development and introduction of proactive and reactive countermeasures.

- Service Level Management Operations Guide. This guide deals with how to negotiate, monitor, and maintain Service Level Agreements between the IT service provider and its customers. Service Level Management is a key service delivery discipline that requires considerable interface with the other service management disciplines.

- Service Desk Operations Guide. Deals with the processes and supporting procedures necessary to successfully manage a functioning Service Desk.

- Storage Management Operations Guide. This guide includes information on how to monitor backup jobs to ensure that it completes correctly.

- System Administration Operation Guide. Deals with how to administer the distributed processing environment.

- Workforce Management Operations Guide. This guide covers topics such as recruiting, skills development, knowledge transfer, competency levels, team building, process improvements, and resource deployment.

As can be noted from the above, the Microsoft guides can be a very valuable resource to any organization that uses Microsoft technologies, as it applies best practice principles and provides specific guidelines that is freely available and can easily be adapted to the needs of specific organizations.

4.4.3.4. Microsoft Operations Framework and Solutions Framework Conclusion

A basic premise of both ITIL and MOF is that business priorities drive IT services (Microsoft Corporation, 2002d, p.16). The MSF readily supports, co-exists with, and augments industry standards and methodologies for organizations that have previously adopted them.

The Microsoft Enterprise Frameworks (incorporating MOF and MSF) has a great deal of communality with both the CobiT and ITIL frameworks. The MOF an MSF address the major areas of IT governance including process management for efficiency and effectiveness, organisational structures with guidelines for IT HR management and IT project management, business alignment and value creation, and the management of IT related risk.

Any institution that uses Microsoft technologies can greatly benefit from using the freely available MOF and MSF frameworks. The documents are under constant revision and updates and additions are often made.

4.4.4. BS15000

BS15000 is an IT service management standard. It consists of two parts: BS 15000-1:2002 IT Service Management Part 1: Specification and BS 15000-2:2003 IT Service Management Part 2: Code of Practice (Mingay and Govekar, 2002, p.1).

According to Mingay and Govekar, the relationship between ITIL and BS15000 with its associated workbook can be described as a pyramid, with BS15000 at the apex, the Code of Practice at the second tier and ITIL as more general guidelines. BS15000 has been described as the “ten commandments” of ITIL. The advantage BS15000 over ITIL is that it is a certifiable entity (Mingay and Govekar, 2002, p.2.)

BS1500 identifies BS7799 as the standard to be used for a BS15000 audit in the area of information security (British Standards Organisation, 2002, p.9), and it is thus clear that BS7799 is regarded as a subset of BS15000.

BS15000 was authored by the IT Service Management Forum (itSMF). The itSMF is an independent and internationally-recognised forum for IT Service Management professionals worldwide. It is a not-for-profit organisation involved in development and promotion of IT Service Management "best practice", standards and qualifications since 1991. The itSMF have chapters in Australia, Austria, Belgium, Brazil, Canada, Denmark, France, Germany, Italy, Japan, Netherlands, Norway, Portugal, Romania, South Africa, Sweden, Switzerland and USA (itSMF, 2004, p.1).

BS15000 proposes the use of a plan-do-check-act methodology that links the service management processes with the desired outcomes. Graphically they depict the methodology for service management as follows in figure 4.5. (British Standards Organisation, 2002, p.1)

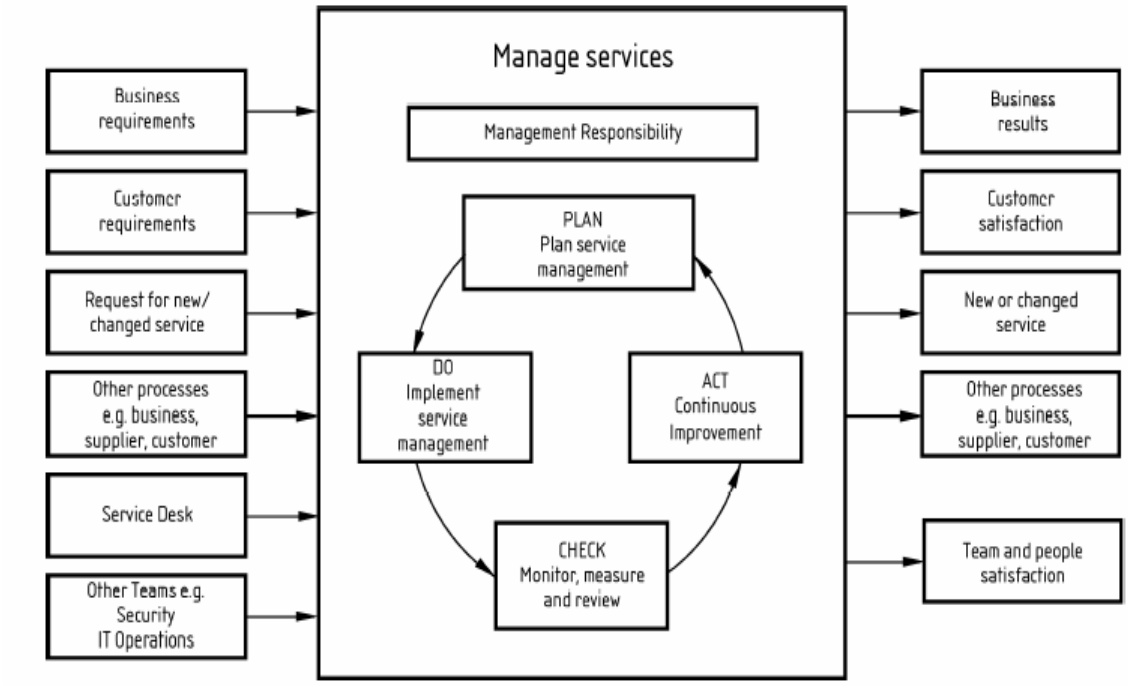

Figure 4.5. Plan-Do-Check-Act methodology for service management processes (British Standards Organisation, 2002, p.1)

BS15000 organizes the IT processes into five categories as presented in Figure 4.6. and provides recommendation for managing these processes (Sallé, 2004, p.14). The processes can easily be correlated with their ITIL equivalents.

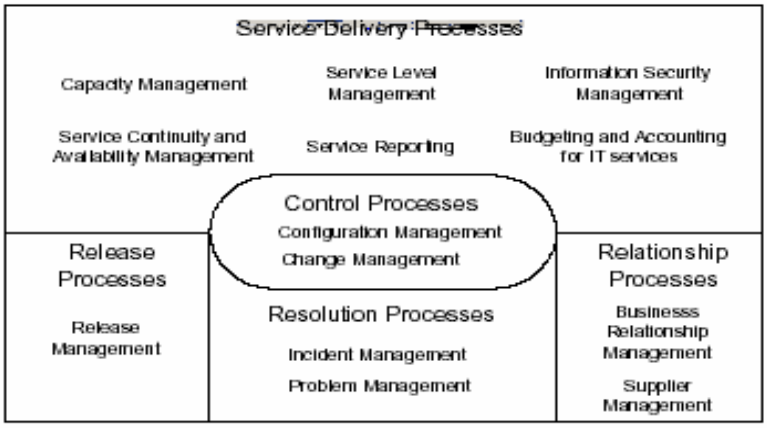

Figure 4.6. BS15000 Service Management Processes (Sallé, 2004, p.14)

As a standard, the BS15000 is prescriptive, as an extract from section 3.1, "Management Responsibility" illustrates: "Through leadership and actions, top management shall provide evidence of its commitment to developing, implementing and improving its service management capability within the context of the

organization's business and customers' requirements" (British Standards Organisation, 2002, p.4).

It is anticipated that BS15000 will become an ISO standard (Sallé, 2004, p.10), and it can thus be expected to play a significant role in IT service management in the future.

4.4.5. Balanced Scorecard and Strategic Maps

Kaplan and Norton describe the balanced scorecard (BSC) as a "new strategic performance management system" (Kaplan and Norton, 2004, p.xi). The BSC was initially proposed to improve the measurement of the organisation's intangible assets, but in practice it was found to be a powerful tool for describing and implementing an organisation's strategy (Kaplan and Norton, 2004, p.9). The BSC enables organisations to align organizational resources, which includes executive teams, business units, support groups, information technology and employee recruitment and training, to focus on implementing strategies. One of the basic premises of the BSC is that executives and employees paid attention to what they measured and that people can not manage what they can not measure. They believe that, if a company's priority measurement system is based on the financial accounting system, they would have no foundation for measuring and managing the value created by enhancing the organisation's intangible assets. The intangible assets include employee capabilities, databases, information systems, customer relationship, quality, responsive processes and innovative products and services (Kaplan and Norton, 2004, p.iv-xiv). It is argued that strategic alignment determines the value of intangible assets (Kaplan and Norton, 2004, p.13). So, for example, the value of the IT investment cannot be measured in terms of replacement cost, or what it cost to create the asset. An organisation may spend more on IT than is required to execute its strategy that would expose the company to risk. On the other hand, a relatively small investment, but in full support of the organisation's strategy, can have value to the organisation that is much greater than its inherent value.

The BSC proposes that value of an organisation should be measured, and strategy described from different perspectives:

- Financial and fiduciary measures.

- Customer (or stakeholder) perspective.

- The internal process perspective regards the internal processes as that what creates and delivers value to the customers. The argument is that the performance of the internal processes is one indicator of subsequent improvements in customer and financial outcomes.

- The learning and growth perspective is important because intangible assets (people, technology and organizational climate) are the ultimate source of sustainable value creation (Kaplan and Norton, 2004, p.7).

At the heart of the organisation's balanced scorecard is the management information provided by the IT infrastructure (IT Governance Institute, 2000c, p.17).

From the perspective of IT as a business providing services to the parent organisation, the BSC has been applied to the IT function and its processes (Sallé, 2004, p.7). A cascade of balanced scorecard has been used to describe the relationship between IT and business as follows in figure 4.7. (Sallé, 2004, p.8):

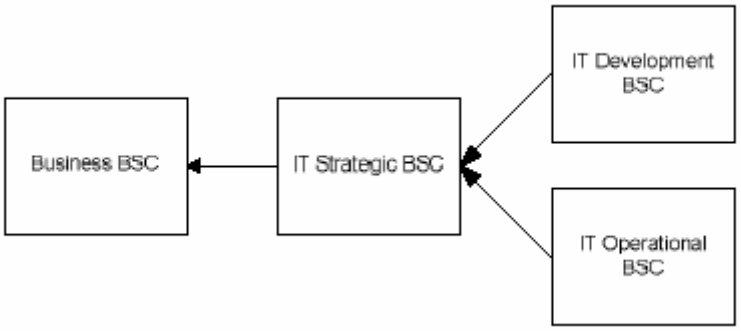

Figure 4.7. Cascade of Balanced Scorecard (Sallé, 2004, p.8)

The United States General Accounting Office (GAO) issued guidelines to assist federal agencies in understanding and devising effective IT measurement implementation approaches. One of the drivers for many of these initiatives is the pressure from the American Congress, through several acts, to improve performance, increase accountability, and to reduce cost (GAO, 1998, p.5). They proposed the balanced scorecard framework that looks at goals, objectives, measures (tiered for various decision-making levels), and accountability in key goal areas. The GAO provided a number of key objectives and sample measures that could be used in the

IT departments of federal agencies (GAO, 1998, p.33-44). As a first step, a key question to be answered is: "What is the current and future purpose of IT?" This is determined by the enterprise's and the customer's or the stakeholders's goals and objectives. Then the IT organization must answer the goal question: "If we succeed, how will we differ?" in terms of specific goals in the balanced scorecard's four main areas. This framework is graphically depicted in figure 4.8. (GAO, 1998, p.33).

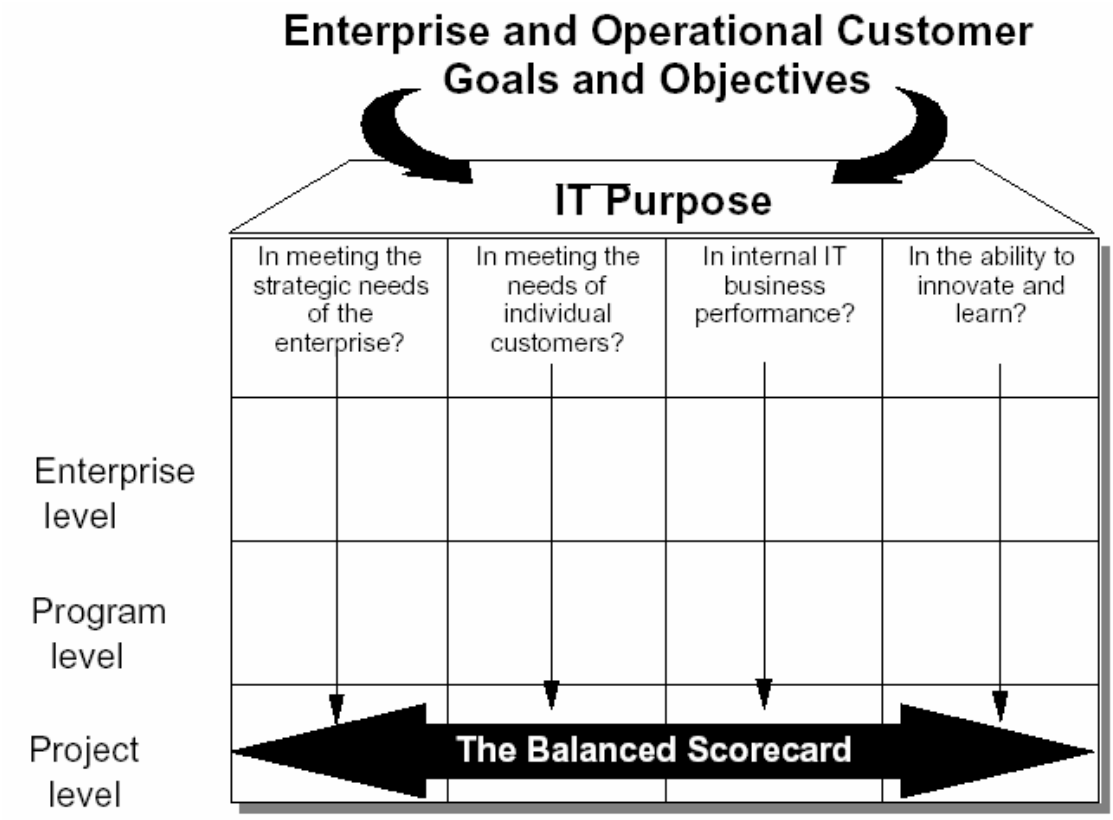

Figure 4.8. An IT Balanced Scorecard Approach (GAO, 1998, p.33)

Some of the valuable contributions that the BSC approach makes in the governance arena are:

- The expanded view of value creation and that IT brings. Value creation and retention are some of the most important issues faced by the board.

- A strong emphasis on appropriate measures to achieve the desired value outcomes

- Processes and procedures that are applicable to the management of intangible assets are described.

4.4.6. Other IT Frameworks and Standards

Several standards and codes of practice exist in specific focused areas of IT management, such as in the area of information security.

At the other end of the spectrum of standards and guidelines are the enterprise standards and guidelines, of which the corporate governance guidelines would form a part. One such best practice framework was developed by COSO (Committee of Sponsoring Organisations). COSO is a voluntary private sector organisation established with the aim of improving the quality of financial reporting through business ethics, effective internal control and corporate governance (IT Governance Institute, 2004, p.27). It was originally formed in 1985 to sponsor the so called Treadway Commission. COSO have developed a framework, "Internal Control-Integrated Framework", which has become the most commonly adopted framework in compliance with the US Sarbanes-Oxley Act which requires organisations to select and implement a suitable internal control framework (IT Governance Institute, 2004, p5, p.7). COSO as a framework is therefore an enterprise governance framework, with more resemblance to the King II corporate governance guidelines (IoD, 2002b) than an IT governance framework. The IT Governance Institute makes the point that organisations should have IT control competency in all COSO components. COSO identifies five essential components of effective internal control as: control environment, which refers to, amongst others, the policies, procedures and the "tone at the top"; risk assessment; control activities; information and communication; and monitoring. The IT governance Institute has developed an elegant conceptual model that shows the link between the Sarbanes-Oxley reporting and disclosure objectives, the COSO components and the CobiT objectives (IT Governance Institute, 2004, p.34), demonstrating the close link between enterprise governance and IT governance. In a similar way, the relationship between different IT governance standards can be of a hierarchical nature, it can be complementary to

each other, or one framework may simply have been superseded by another. This is the topic of the next section.

4.5. The relationship between the different frameworks.

Each of the IT standards and methodologies has specific applications, serves unique purposes, or is limited to a particular domain (Microsoft Corporation, 2003, p.26).

All these frameworks are tools to assist the organisation to manage the very important IT related functions and services, so as to limit risk and increase the potential benefit from the IT investment. It is clear that some of these approaches overlap, as some have a wider scope than others. So, for example, do the ISO 17799 guidelines focus on security aspects, and ISO 17799 can be seen as a more focused standard dealing with some areas of the broader CobiT guidelines. Calder and Watkins (2002. p.24) argue that the most practical and effective way for directors to handle their information security risks, is to adopt and implement an information security policy and information security management system based on ISO 17799. Because of the large overlap of CobiT and ISO 17799 in the area of information security, compliance with the one framework goes a long way in compliance with the other. Similarly, compliance with ISO 9000 document control requirements will meet ISO 17799 documentation control requirements (Calder & Watkins, 2002, p.32). Similarly, while discussing implementation of ISO 17799, Calder and Watkins (2002, p.52) note that it is imperative to ensure that there is a method of remaining up to date with changing issues in the security environment. In a Microsoft environment, that means that information security personnel should ensure that the Microsoft security best practice is integrated into the organization's information security management system (Calder and Watkins, 2002, p.52).

The COSO, CoCO, the King II report (IoD, 2002b) and similar codes can be described as overall business control models, or enterprise models (IT Governance Institute, 2000a, p.11). The IT Governance Institute refers to a number of "focused control models" and states that good examples of the latter category are the Security Code of Conduct from the DTI (Department of Trade and Industry, UK), Information Technology Control Guidelines from CICA (Canadian Institute of Chartered Accountants, Canada), and the Security Handbook from NIST (National Institute of Standards and Technology, US). These focused control models do not provide a

comprehensive and useable control model over IT, which is considered to be a specialized area. The CobiT framework was developed to fill this need (IT Governance Institute, 2000a, p.11). The most closely related framework to CobiT is the AICPA/CICA SysTrust Principles and Criteria for Systems reliability, which is, in part, based on CobiT Control Objectives (IT Governance Institute, 2000a, p.11). CobiT is becoming the de facto standard for IT governance (Sallé, 2004, p.8).

The balanced scorecard is a management and measurement framework that can be used to support IT governance. The IT Governance Institute describes the balanced scorecard as mainly a measurement instrument. IT governance is concerned with delivering value to the business and mitigating IT risks. Delivering value is driven by strategic alignment of IT with the business. Mitigating risk is driven by embedding accountability into the enterprise. Both need measurement, for example, by a balanced scorecard. This leads to the four main focus areas for IT governance, all driven by stakeholder value. Two of them are outcomes: value delivery and risk mitigation. Two of them are drivers: strategic alignment and performance measurement (IT Governance Institute, 2000c, p.17). Sallé expanded on the complementary roles of CobiT and BSC and mapped the cascaded balanced scorecard on to CobiT as depicted in figure 4.9. (Sallé, 2004, p.9).

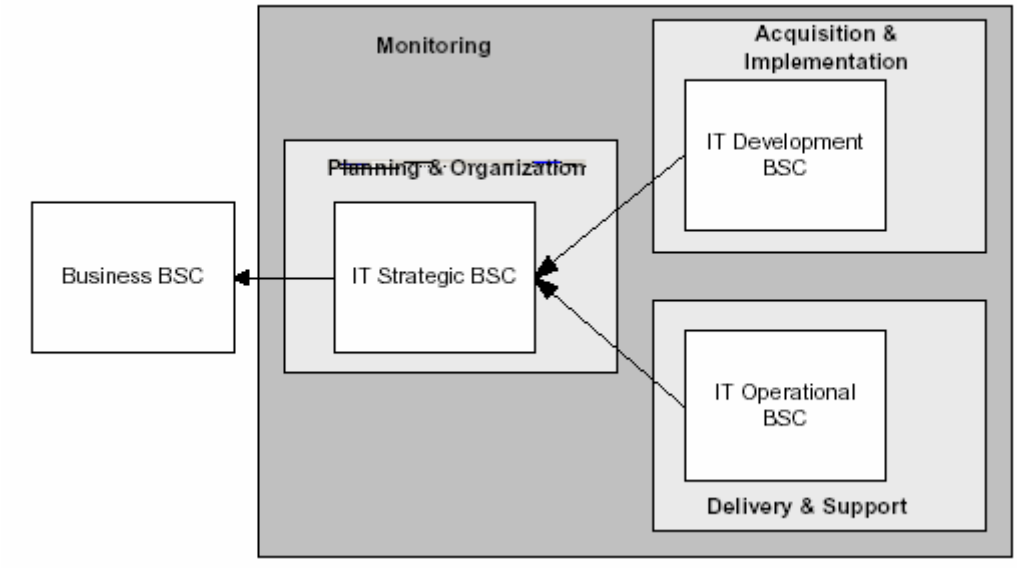

Figure 4.9. Mapping between CobiT and IT BSC cascading model (Sallé, 2004, p.9)

The four domains of CobiT are depicted in bold in the figure above and its relationship with the cascading IT and business balanced scorecards are illustrated.

In chapter one the overlap in the concepts of governance and management was discussed. This overlap can be seen in the similarities between CobiT, which is described as an IT governance standard, and BS15000 and ITIL which are described as IT service management standards. Sallé (2004, p.21) did a mapping between BSC and ITIL, and then noted that a similar mapping exists between ITIL and CobiT. He drew attention, for example to the delivery and support domain of CobiT which includes processes such as define and manage service levels, manage performance and capacity and ensure continuous service. These map well on to the ITIL processes such as; service level, configuration, capacity and availability management.

Sallé (2004, p.9) charted the evolution of IT service management frameworks over time and in terms of maturity as depicted in figure 4.10.

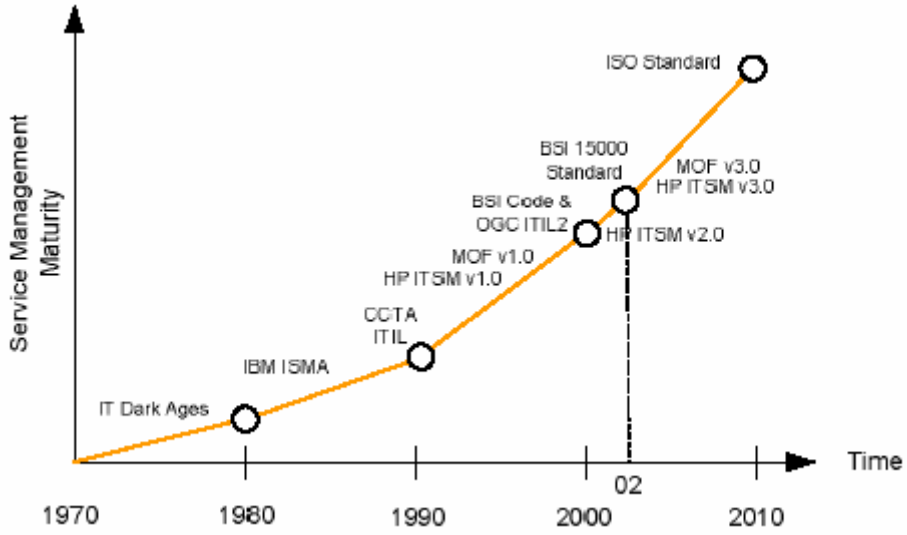

Figure 4.10. Evolution of IT Management Methodologies

Referring to figure 4.10. it can be seen that IBM documented the concepts of systems management in its Information Systems Management Architecture (ISMA) in the early 1980s. In the 1980s the IT Infrastructure Library was created by the UK government Central Computer and Telecommunications Agency (CCTA). The concepts of service management build on the concept of systems management. An updated version of ITIL was published in 2000. In the year 2002 the British

Standards Institution's Standard for IT Service Management (BS15000), which supports the best practice processes of ITIL, was released. The latest version of the Microsoft ITIL-based Microsoft Operations Framework was published in 2004. Experts in the field foresee that the end of the decade should see the standardization of ITSM processes under ISO (Sallé, 2004, p.10).

In chapter two, the similarity between corporate governance frameworks and quality management frameworks was highlighted. Sallé came to a similar conclusion regarding IT governance frameworks as he noted that it is significant that ITIL and other IT service management frameworks teach the same essentials that are used to deliver quality improvement (Sallé, 2004, p.20).

Sallé refers to the work done by Carter and Pultorak who suggested that one can categorize IT frameworks in six dimensions. The following description of the six dimensions is taken verbatim from Sallé, and figure 4.11. below is a graphical representation of how the different frameworks can be mapped in the different dimensions (Sallé, 2004, p.20).

- Structure and Roles: The assignment of responsibility for performing specified activities to specific groups or individuals.
- Metrics: The assignment of measurements to people, processes, technology and controls to ensure that they comply to what they are intended for.
- Processes & Practices: The interrelated series of activities that combine to produce products or services for internal and external clients.
- Technology: The technology that is supporting the IT delivery
- Controls: The assignment of controls to IT processes to ensure that they deliver efficiently and effectively in line with clients requirements.
- People: The people that support effective and efficient IT service management.

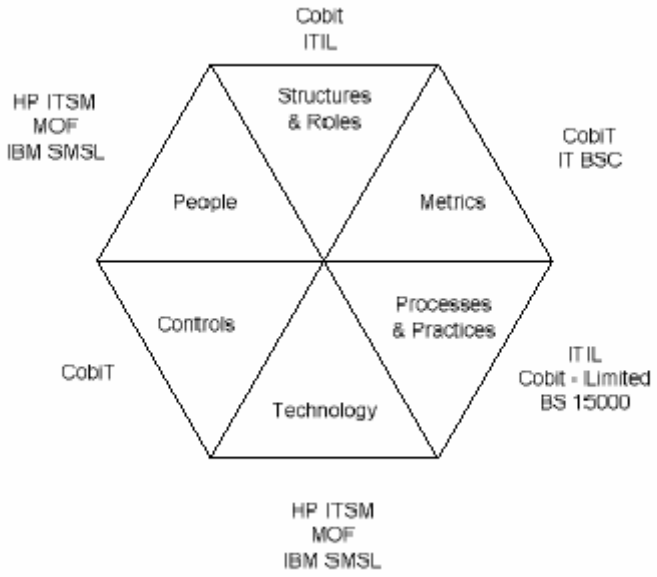

Figure 4.11. Positioning IT Frameworks (Sallé, 2004, p.20)

The IT Governance recently published the "CobiT Security Baseline, An Information Security Survival Kit" which maps CobiT controls to ISO 17799 (IT Governance Institute, 2004, p.11-17), and extends the CobiT guidelines in the area of information security. The document provides very useful information security checklists for use by individual users, managers, executives and the board (IT Governance Institute, 2004b, p.19-30).

4.6. Potential dangers in adopting "best practice standards"

Companies that succeed in the long term must be able to compete successfully in the market by either following a low-cost strategy, or by differentiating themselves in the view of the customer (Ward and Peppard, 2002, p.106). If all the players in the market follow a low-cost strategy by implementing the same "best practice" policies and procedures, without differentiation, competition will become fierce, and profit margins will become very small. The majority of organizations have to follow a differentiation strategy. In that environment the emphasis is on innovation, creativity and market orientation rather than system driven management controls (Ward and Peppard, 2002, p.109). The advice from the King Report on corporate governance (Institute of Directors, 2002, p.7) to balance conformance with performance is thus very apt in the area of IT governance. Neill McBride, from the IT Service Management Research Group, De Montfort University, warned that the pursuit of

best practice may freeze processes, stifle innovation and reduce the potential for change because of fear of moving away from standard procedures or altering practices which are perceived by the industry as the best way of doing things (McBride, 2004, p.9).

The IT Governance Institute therefore argues strongly that each organisation should carefully consider the appropriate control objectives for its own circumstances. The nature and extent of controls that are necessary depend, on a great extent on the size and complexity of the organisation (IT Governance Institute, 2004, p.8).

4.7. Conclusion

Various standards for IT governance were referred to in this chapter. The characteristics of the frameworks were highlighted by referring to the actual documentation, as well as other sources. The different frameworks can be classified using different criteria, such as the era in which it evolved. This historic perspective, considering the evolving role of IT in organisations, assisted understanding of the relationship between the different frameworks. Management and governance evolved with the role of the technology from a focus on infrastructure management to IT service management to the current emphasis on the strategic role of IT governance. A very important conclusion that can be drawn from an examination of the different frameworks is that there is quite a large overlap in the areas addressed by the different frameworks. The frameworks are complementary with different areas of emphasis. Ward and Peppard (2002, p.21), for example, summarised the lessons learn from the different eras in which the frameworks developed, and noted that a good strategic information system is dependant on a sound infrastructure, and dependable IT services. It can be concluded that an organisation can only invest in strategic information systems when it can depend on stable, well managed services, and reliable stable services are, in turn, dependant upon stable, well managed systems.

A further six dimensions into which these frameworks can be categorized are summarised in figure 4.11. Thus, for example, if an institution would like to implement IT governance controls, CobiT would be the most likely candidate that will meet their needs. If an institution makes extensive use of Microsoft software, and would like to use a framework that links governance issues with service

management right down to the technical level, the MOF and MSF frameworks would be the best fit.

Different types of institutions, depending on its size, whether it is a private or a public organisation, its culture, the legal environment in which it operates and other factors, will put more emphasis on different requirements when selecting the best practice guidelines that it will follow. Weill and Ross (2004, p.214) came to the conclusion that IT governance in not-for-profit organisations is the same as in profit-seeking firms in many ways but noted a shift in emphasis in some areas such as a greater need for consensus, transparency and equity, as well as a broader view of value than commercial enterprises. In this type of environment, the measures may be different and, for example, "value on investment" (VOI) might be a better metric than the "return on investment" metric often used in commercial environments (Norris, 2003, p.1). In the next chapter IT Governance and the role of the different frameworks in HE will be discussed, and a further set of criteria for classifying and selecting a governance framework will be developed.

"Traditional pyramid-shaped organisations, built on hierarchies of command-and-control, are no longer effective in fast-changing markets. Centrally-held power, along with multiple layers of management, simply do not translate comfortably into great customer service" - Futurologist, Woflfgang Grulke (Grulke and Silber, 2000, p.105)

Chapter 5. IT Governance in Higher Education.

5.1. Introduction

In chapter two the governance of corporations and the governance of HE was discussed. The main enterprise governance objectives are to create and maintain (or protect against loss) value for stakeholders in the organisation. Due to the value of education in modern society, value creation and protection for a large number of stakeholders, including international organisations such as the United Nations, national government, regional government, business and industry, students and staff must be considered. Key governance questions are: what decisions must be made, by whom, how will it be made and how will assurance be obtained about the status and direction of processes? The environment in which IT governance functions was described, and some general governance principles were identified.

In chapter three the IT governance discipline was discussed. The key governance questions that apply to corporate governance must be answered in relation to IT governance. Several IT governance frameworks that have been developed were identified and discussed in chapter four.

In this chapter the following key questions will be addressed:

- The importance of IT in enterprises in general was identified, but how important is the IT resource in HE?
- If value is determined by the stakeholders, who are the main stakeholders in the IT function in HE institutions and what is of value to them?

- How is value created through the application of IT in HE institutions? What are the risks related to IT in the HE environment and how will value be protected against loss?

- Is there potential benefit in adopting one or more standard IT governance framework for HE in South Africa?

- How might the governance framework be adapted to suite the HE environment?

- What is the status of IT governance in HE in South Africa?

The need and value of IT in HE, and the need for good IT governance in HE will be established. The most important issues facing IT departments in HE institutions will be addressed. The IT governance maturity model will be applied to draw conclusions about the current status of IT governance in South Africa. After having examined evidence regarding the opportunities and IT related threats to HE institutions, and the current state of IT governance in HE, the role of IT governance frameworks will be argued.

The approach that will be followed to address these questions will firstly be to identify the key IT application areas and how these add value to the different stakeholders. Porter's value chain model will then be used to assist with identifying the different areas where value is created (or may potentially be applied to create value) for the stakeholders. The opposite of identifying how to create value is identifying how value can be lost. Some of the important aspects of computer security and information security in an HE environment will therefore be ascertained. The current state of IT governance will be analysed in the light of a survey that was done involving leaders of IT departments in HE in South Africa. The governance questions relating to who should make what decisions and how those decisions can be made in an HE environment are addressed with reference to some of the frameworks and models identified in the previous chapter.

5.2. Why IT Governance in HE?

There is no doubt about the value of education and lifelong learning in society (UNESCO, 2000, p.5,16,72). It can be argued that the education sector is important,

and that if IT is important in this sector, IT governance in this sector will be of great importance. In the previous chapter the importance of IT governance in modern organisations was highlighted. The arguments that establish the importance of IT governance in modern organisations in general apply also in HE Institutions. Competitiveness now extends beyond business and industry to include educational institutions that are the builders of human capital, rather than products and materials (Abrahams, 2003, p.60). IT is a major cost component in many HE institutions in South Africa (Ministry of Education, 2003, p.36), and therefore requires management attention. The need for IT governance depends to a large extent on the importance and role of IT in an HE Institution. If IT is an integral part of the business, and is fundamental to support, sustain and grow the business, it is reasonable to expect that it will attract management attention.

A recent survey that was done in the United States indicated that over 60% of academic leaders agreed with the statement that online education is critical to their strategy, and virtually none disagreed with the statement (Allen and Seaman, 2004, p.13).

IT related spending at one university in the Western Cape province amounted to more than 18 million Rands annually (Johl, 2000, p.63). At some institutions, the large cost associated with modernizing IT infrastructure, as well as the risk of failure of some very important projects, has put IT issues on the HE council's agenda (Personal communication, Mr. Chris Nel, IT Director at the University of Port Elizabeth, 2004). HE institutions in South Africa spent more than R37 000 000 on Internet services during 2003 (personal communication, Mr Duncan Greaves, 2005). It therefore becomes clear that, simply because of the high cost of IT services in HE institutions in South Africa, it demands the attention of those responsible for institutional governance. Davenport (1993, p.46) argued that IT investment in itself cannot be expected to provide economic return, and that if IT is used simply to automate existing processes, economic benefits are likely to be minimal. The argument is that IT enables major process changes, and that is where much benefit can be derived from the application of IT. Changing major business processes clearly involves much more than simply the IT function. Changing processes through the application of IT may change traditional power balances (Davenport,

1993, p.174) and good IT governance becomes key to the success of business process innovation.

In a survey of HE institutions in South Africa, conducted during 2003, 43% of the IT directors who responded indicated that their institutions would be looking at implementing an IT governance framework in the 12 months following the survey. The survey and the results from it are described later in this chapter, but the fact that such a high percentage of the institutions is considering implementation of such a framework, is an indication that IT governance has become an important issue in HE Institutions. This is not surprising because the IT services and infrastructure are critical to an HE institution and underpin many of the activities of the institution (Ministry of Education, 2003, p.8). The academic activities of teaching, learning and research are the core business of HE institutions (Ministry of Education, 2003, p.36). IT is a key factor in support of the academic and administrative functions (student information and administration, finance, human resources, buildings and maintenance etc.) in an HE institution (Ministry of Education, 2003, p.69).

The council and the principal of an HE institution are responsible to initiate measures to promote economy, efficiency, effectiveness, and ethical behavior in accordance with relevant legislation. These measures include the planning, budgeting, authorisation, control and evaluation of the procurement and utilisation of resources (South Africa, 2003b, p.17). The IT governance discipline addresses measures to control IT resources, and is therefore an appropriate item on the agenda of council and the principal of an HE institution.

Innovation and technology can drastically change the HE competitive environment. It is therefore essential to govern IT in order to ensure that the institution remains competitive and can meet the demands created by a changing environment. The potential impact of technology is illustrated by the dramatic results achieved by a university level institution in South Africa called CIDA (Community and Individual Development Association). Whereas the average cost to educate a student at a South African university is approximately R35 000/annum, CIDA's cost is approximately 10% of that amount. Despite the low cost, CIDA spends almost three times the average amount of time that other institutions spend on teaching their students. CIDA boasts much higher attendance as well as pass rates than other institutions.

One of the key success factors has been the use of technology (including ICT) in teaching (Van der Merwe, 2003, p.72,76).

It can be argued that the amount of attention that a resource should receive from management is related to the value of that resource to the institution. How valuable is the IT resource in HE, and how is value created in the HE sector? Some of the most important generic ways in which value is created and captured through the use of IT include: reducing costs; enhancing products and services; ensuring that goods and services are allocated to those valuing it most; coordination or reengineering of the supply chains in the industry, possibly by eliminating intermediaries (Saloner & Spence, 2002, p.1-80; Ward and Peppard, 2002, p.100-103,244-274). To analyze how value is created through the use of IT in HE institutions in South Africa, information was gathered from documents from three HE institutions. As a result of merger activities, a number of HE institutions in South Africa have prepared documents describing their IT infrastructure and services as part of the due diligence process required from the merging institutions. These documents from two South African universities and one technikon were analysed. Porter's value chain model (Porter, 1986, p.17-21) was used to demonstrate where and how these applications add value to the institutions. The generic ways of creating value mentioned above were applied. The different applications and potential applications, and how they add value, are summarised in Appendix A. It becomes clear from the wide range of applications that IT is an integral part of almost every aspect of the HE institution. It is also evident that the impact of IT will become even greater in the future. Suomi and Tahkapaa (2004, p.364) refer to Porter's value chain model as one of the most established and well used governance structure concepts. The value chain model helps the individual participants in an exchange relationship to understand their place in the totality. In this study it was used to demonstrate the role of IT in adding value to the organisation.

IT has already had a very significant impact on the HE sector and the impact of IT is likely to become even greater. One recent study found that approximately 1.9 million students were studying online during 2003 in the United States of America alone. The same study projected a growth rate of online students of more than 24% (Allen and Seaman, 2004, p.1). Educators do not perform manual work, they work with information. It can thus be expected that as the tools of information

management change, it will have a significant impact on educators as knowledge workers. The most significant trend in the education industry has been the move to e-learning. The tools and the educator's roles have started to change, driving the trend towards more flexible, needs-driven and self-directed approach. Internet Technologies have already changed the nature of many businesses, compelling them to pay attention to IT governance. There are a few characteristics of the Internet and related technologies that underlie the potential for e-learning to create value and to change the industry, much in the same way as it does for electronic commerce (Saloner and Spence, 2002, p16-18). These include:

- Reach. The Internet provides unprecedented geographic reach for HE institutions and for students. Physical distance from an information source does not affect users of the Internet.

- Flexibility an ease of use. The WWW provides a flexible and easy to use programming and user environment.

- Personalisation. The Internet offers the capability to personalize transactions and content at low cost. Portals offering students access to just the subjects for which they have enrolled is an example.

- Interactivity. The ability of users to tailor the information they receive or to search for the information they want is of value to them.

- Asynchronous communication. Users can access electronic services at any time that is convenient for them. A student could, for example, work through an online tutorial at any time of the day on any day of the week.

- Encyclopedic Nature. The information on the Internet is accumulated over time becoming even more valuable as the content is extended and updated continually.

- Richness. The capability of the Web technologies such as the support for links, search capability, multimedia, personalization and dynamic content, makes it possible for educators to provide students with unprecedented quality of content.

As computers get faster, resolution of display units increase, bandwidth gets higher and content development tools become more powerful and simpler to use, this medium is likely to become even more powerful for education delivery. It can therefore be expected to transform the education industry to an even greater extent. It is thus imperative that HE institutions pay serious attention to IT governance.

The range of IT based applications and services are huge, and beyond the scope of this document. A few examples of the types of applications that have a disruptive effect in the supply side, the demand side and the internal processes of HE are mentioned to illustrate the effect of IT on the HE sector.

Integrated Tertiary Software (ITS) (Pty) Ltd is a South African company that provides the HE sector in South Africa with an integrated suite of software that addresses a range of HE institutions' needs. On their official website (ITS, 2004), they list 12 Universities and 14 Technikons as their South African clients that use one or more of the ITS modules, making ITS the most widely used computerized administration system in HE in South Africa. Appendix B is a summary of the functions of the ITS system, which covers a wide range of the type of applications used in HE administrative systems. The systems are grouped in, amongst others, the following functional areas: Student Management; Financial Management; Human Resources Management; Web Access Systems; Facilities Management; Library Systems; and Management and Statutory Information. This gives some indication of the types of administrative systems used in HE institutions in South Africa (ITS, 2003). Where the ITS system is used, particularly the student and finance components, unavailability of the system for longer than a few hours is considered as unacceptable, and disaster recovery plans often consider 48 hours to be the maximum allowable time for systems to be recovered (Personal communication, Mr Andre Schonken, Chairman of the P E Technikon Information Security Committee, April 2004). Unauthorised changes to, or unavailability of these systems can impact on the entire organisation. Co-ordination and agreement between departments on changes or upgrades to systems are imperatives. It is thus appropriate that such integrated systems should be directed by a governance structure such as a project steering committee with representation from executives from the major departments. The same group will likely require feedback on threats to the systems, and what measures have been taken to address the associated risks.

The education process is increasingly seen not as the transmission of knowledge only, but as a complex, interactive effort in which the learner engages ideas, applies principles and solves problems with the encouragement form educators and with participation from other students. This approach to education requires easy and direct access to information around the world and support for communication between the parties. Access to technologies and tools such as the Internet, digital libraries, email, and threaded discussions have become essential to accomplish the core mission of HE institutions (Educause, 2002, p.8). Social software, including Instant Messaging (IM) and Blogs and collaborative tools are likely to become more important in the education environment (Kaplan-Leiserson, 2003, p.1). All of the above support the notion that IT is rapidly changing the business of education and the way that educators interact with their main stakeholders, students.

Tight budgets, security concerns, increased emphasis on IT's business value and growing complexity in the Academic IT business environment are some of the trends that led Zastrocky and Yanosky (2002, p.1) to advise IT administrators to build linkages and relationships with the business units in their organisations, in other words, to pay more attention to governance issues in their organisations.

From the evidence presented above, the value of IT in HE is well established. It is the responsibility of the governance structures not only to create value, but also to protect the value for the stakeholders. The high risk associated with IT in HE institutions is a further reason for good IT governance in HE. It is therefore appropriate to discuss the IT related risks in the following section.

5.3. IT Related Risks in HE Institutions

Information Security is a key component of IT governance (Calder and Watkins, 2002, p4) in a commercial environment as well as in an HE environment. It is outside the scope of this document to identify the full range of risks associated with IT in an HE environment. The purpose of this section is simply to establish some of the most outstanding issues related to information security in the HE environment, thereby supporting the argument that good governance in the area of information security in HE is essential. The argument is that:

- HE institutions have information related assets that are valued by their stakeholders and that are exposed to IT related risks.

- The HE environment poses some special challenges in the area of IT related security.

- It follows from the two assertions above that information security governance is an important issue in HE.

- HE institutions can benefit from adopting information security best practice standards because the technologies and types of threats as well as the generic solutions to address the threats are very similar in HE and in the general business environment.

The risk that the board of directors is concerned with is anything that prevents an organisation from achieving its objectives. To address risks emanating from IT in an HE environment, it is appropriate to refer to that which is of value to the organisation, and that which may lead to the institutions not reaching their objectives. From the above it is clear that not all institutions will have the same perception of what a risk to them constitutes. So, for example, risk may arise in the area of IT investment. It can be argued that an organisation with a low cost strategy will be more concerned about spending too much on an IT infrastructure, as that will jeopardize their position as a low cost provider of education. On the other hand, neglecting to invest in IT in areas where it could bring about efficiencies in the business is clearly not to the low cost producer's benefit. For an institution with a strategy that focuses on customer satisfaction, under-investment in, for example, the availability of computer laboratory facilities, will pose a greater threat to achieving their strategic objectives. A threat to the entire public HE sector could be that it cannot meet with a changing need of their customers. More and more students may, for example, want to study with education providers that can meet their requirement to study anywhere, at any time, and at their own pace, and provide them with an internationally acclaimed qualification.

There is a broad range of information in an HE institution that requires attention to security. Examples include: student records including marks, biographical and disciplinary records; examination papers; financial information; personnel records;

research data with restricted access; and interpersonal communication such as e-mail. The HE institution may make provision for electronic financial transactions and micro transactions such as billing for Internet use or photostat facilities. The confidentiality, integrity and availability of the above mentioned information must be protected. Some of the characteristics of an HE institution that makes it more complex than most other business environments include: large numbers of users; the fact that workstations are not dedicated to a specific user; large number of applications that may be used in an educational environment; the fact that many students may have specialized skills in computer and network systems, and are in a position to launch sophisticated cyber attacks; and there is often a large group of unsophisticated new students on the campus, creating a weak link in campus security.

Many South African Institutions now provide their students and other stakeholders with access to information via the Internet. Much of this information is potentially sensitive, such as financial status or results of assessments. This service is clearly of value to students, but to provide access to business information via this mechanism, requires a lot of attention to information security (Pipkin, 2000, p.6-11).

E-learning systems are evolving from peripheral add-ons in traditional classrooms to mission critical systems in HE institutions and the online e-learning environment serves as a virtual campus for students and academic staff (Resmer, 2004, p.1). E-learning systems have some characteristics that make security (confidentiality, integrity and availability) a challenge. These include: large numbers of users, long session lengths, high levels of file sharing, the need for rapid response-times, highly distributed users and widely varying loads (Resmer, 2004, p.2-3). These challenges, coupled with the fact that any interruption in the service in this environment becomes like a complete shutdown of the virtual university, highlight the need for good controls in this area.

How severe is the threat to the information systems at HE institutions? At the Port Elizabeth Technikon, an intrusion detection software tool called Snort was used to alert administrators of potential attacks on the network. During a one week period, between 5 January 2004 and 11 January 2005 (5 days and 19 hours), a total of 103619 alerts representing possible intrusion attempts or probes from 15662 different

IP addresses of 110 different types of potential intrusion attempts were reported (Personal communication, Mr. Eldridge Van Der Westhuizen, Firewall Administrator at the Port Elizabeth Technikon, 11 January 2005). At the same site, 2991 viruses were removed from email messages during the seven day period from 4 January to 11 January 2005 (Personal Communication, Mr Lusizo Mahlengi, Systems Engineer responsible for messaging systems at the Port Elizabeth Technikon, 11 January 2005).

HE institutions operate some of the world's largest collections of computers and networks. In many cases, the computers and networks found in HE institutions represent the emerging systems of the future. The threat of terrorism and the disruption of international services via the Internet make it imperative that steps are taken to strengthen and protect the security of HE networks and information resources (Educause, 2002, p.1; Kovacich, 1998, p.154-158). It is believed that every significant terrorist or criminal organisation has cyber-capabilities, posing a serious threat to organisations linked to the Internet (Calder and Watkins, 2002, p13). Internet connectivity is essential for HE institutions, but this valuable resource must be managed in such a way that the risk associated with its use is brought to an acceptable level.

It is estimated that approximately 15% of the advertised Internet addresses are accounted for by the research and education community worldwide (Educause, 2002, p.9). The majority of the HE community, students, does not have the same perspective of the institution's security as, for example, administrative staff will have. The high-speed connections of HE institutions, the fairly relaxed security environment, combined with the concentration of technology skills at HE institutions, create an environment that makes HE facilities a soft target for cyber terrorists, resulting in risks for the institution, as well as the whole Internet community.

In an European survey involving 3400 organisations in the public and private sector, 43% of them are reported to have said that cybercrime would be the most important and dangerous form of criminal activity in the future (Calder and Watkins, 2002, p.11). A British survey found that 33% of British organisations had not appointed a specific director to take responsibility for identifying and countering information

security risks, despite significant evidence of loss in most of the organisations (Calder and Watkins, 2002, p.12).

HE institutions may be particularly concerned about the loss of reputation that may arise from a compromise of their IT systems. It would, for example, be very embarrassing to an institution if it became public that students were able to obtain access to examination papers, or if the records of qualifications obtained by students had been altered through a breach of security. In case of negligence, or where due care was not taken, the principal of the institution can be held accountable for losses (IoD, 2002b, p.19, 30, 44). It can be argued that one of the best ways that the principal can be protected from liability is to adopt, as policy, an internationally accepted best practice such as ISO 17799 or CobiT. This is the approach that was followed by at least one HE institution in South Africa, the Port Elizabeth Technikon.

In America, the majority of HE associations have formed the Higher Education Information Technology Alliance (HEITA), which has endorsed a framework for action on cyber security (Educause, 2002, p.7). There is wide recognition among this group that action is required to: detect and prevent attacks from off-campus; detect and prevent attacks originating from campus aimed at off-campus systems; secure vital systems and data against on-campus and off-campus threats. The best practice recommendations developed by this group could be of great value to South African Institutions.

The conclusion that can be made is that the governance of information security at HE institutions is extremely important, not only to the individual institutions, but also to a much wider IT community, and even society at large.

Having addressed some of the issues relating to IT value and risk to HE institutions, the opportunities that are associated with the application of IT in HE will be explored.

5.4. IT Related Opportunities in HE Institutions in South Africa

In a previous section, different applications of IT in HE in South Africa were examined. The conclusion that was made is that IT is pervasive in all aspects of the

HE institutions in South Africa, and has already had a major impact on the education sector. Will this trend increase in the future? Can it be expected that IT will play an even greater role in HE in the future? Should IT governance expect to receive even more attention in the future? The role of the governing structures includes providing direction and approving strategy for the IT function of the institution with a view to adding value to the stakeholders. It is therefore fitting to briefly look at the potential impact of IT on education in the future. What future opportunities and benefits can be envisioned for the application of IT in HE?

While directing an organisation it is not only important to recognize the existing environment, but also to attempt to predict what the future will look like. Technology can be very disruptive to any industry. For business leaders to imagine that the HE landscape will remain unchanged in the next ten to twenty years, would expose their organisation to a very high risk.

A small group of three students at the masters level associated with the Port Elizabeth Technikon, engaged in "brainstorming" (Page, 1998, p.31; Davenport, 1993, p.154) where the potential of then available technology in HE was explored. During the session a future scenario was generated and is briefly described in the remainder of this section to illustrate likely developments and potential impacts and issues that may result from developments in IT (Personal communication, Ms A. Moller, Port Elizabeth Technikon, 2004).

The group identified some of the following developments in technology that can be expected to have an effect on HE:

- Processor power is still increasing at an exponential rate (doubling every 18 months). Current desktop processors are capable of performing 3000 million instructions per second.

- Developments in computer output devices. Figure 5.1. is from the Website http://www.phonescoop.com/articles/moto_wearables [Cited 10 October 2003]. Their description of the set of devices is: "Goggles: Integrated into the frame of exciting, stylish sports eyewear, this device incorporates a heads-up display, digital camera, ear bud and microphone. Due to the power requirements, there is a tethered cord that runs out the back to an external

power supply. You can view 800 X 600 displays while simultaneously staying in touch with the world around you."

Figure 5.1. Goggles (phonescoop.com, 2004).

- Radio networks and increase in available bandwidth. 100 Gigabit network cards are becoming freely available. The rapid adoption of Bluetooth (10m radius) personal area networks is available on most new cellular phones, printing devices and new Laptop and palmtop computers. IEEE 802.11g 54 MB/sec radio local area networks are now available at many universities, airports, conference centers, and even entire cities. Sending pictures via cellular phones has already become a fad. How long before the bandwidth will allow for streaming media? The result is that a person can be connected to high speed international networks with multimedia capability at all times from almost anywhere.

- Miniaturization. Video and audio transceivers the size of a human thumbnail is already freely available. Many of these devices are based on Blue Tooth technology. Small digital video cameras with integrated MP3 recorders, no larger than a matchbox, are now freely available. Such systems can be used to record lecture sessions. That might enable students that were unable to attend a lecture, or would simply like to review the lecture, to listen to it at a later stage.

- Very rapid development in voice recognition and computer voice command interfaces built in as a standard feature on Windows XP operating system and the Windows Office suite. Significant advances in this area are expected as computing power increases. Will this replace input devices such as keyboards? This may have a significant impact on the speed and format in which educational materials are produced, the speed at which student reports can be generated, and the format of assessments.

- Huge volumes of information on every conceivable subject available on the Internet, accessible through search engines that give a response within seconds. How does the lecturer know what is the student's own work and what has simply been downloaded from the Internet? New tools that monitor and control intellectual property will be required. A further implication is that the lecturer may no longer be the primary source of information for the student, alternatives may be more up to date and more authoritative.

- Advances in games and simulation. Simulations are widely used in training of, for example, fighter pilots. One can expect advances in this area to impact on education.

The above mentioned are already available technologies, with prices rapidly coming down. The general rule is that it is, and will become increasingly much cheaper to move information (in whatever format), than to move material (or bodies).

Consider the following scenario: an educator (mentor) dons his multimedia glasses (similar to the device in figure 5.1.), and whatever he looks at and says is immediately transmitted to a nearby device which in turn puts the digital stream on the Internet. Any number of individuals can follow his exposition on his area of expertise, in a number of formats – some with similar devices, others with traditional desktop computers, and others with more advanced devices, such as holographic displays.

The impact of the technology on education can be revolutionary. Why does a student have to go to the expense of traveling to a site to attend lectures, if the student can simply view the class through his glasses? Why listen to a lecture by Prof. Unknown from University Small if he could attend the presentation by Prof. Wellknown at

Virtual University Big on the other side of the planet? Why study a certain topic at university, and possibly not need that information until much later, if you could acquire information or skills whenever you need it, at a time that is convenient to you? In an always-connected world, will the role of consultation increase and the role of formal education diminish? What will happen if the barriers of geography are removed? Can one expect the emphasis to shift from education delivery to certification? Should the HE of tomorrow position itself as a primary information provider, or rather as a broker of education materials and resources? Should the university of the future become an Application Service Provider (ASP) in the education arena that adds value in certification of qualifications? Might the biggest competition for HE institutions come from large publishing corporations producing multimedia educational packages in the future?

Students want flexible learning anywhere, anytime on any medium and it may be that in the future many might select educational institutions based on offering, convenience and price, rather than geographic location.

Consider the scenario where a lecture on a specific subject can be sourced from a live on-line multi-media connection to e.g. a professor at MIT, Oxford University, an institution in Japan or merely from the building next door. The educator and the learners have interaction via visual and audio connection. Several thousand individuals can benefit from this simultaneous interaction. The HR implications are many-fold. The greatest demand will be for excellent and outstanding educators and experts. Mediocre and poor performers will be of limited use. The role of the educator might shift from that of 'talk and chalk' to a course coordinator that defines the structure of a course and coordinates the resources and evaluations. This implies a different skills set and personality trait as compared to the traditional educator.

The need to meet individual needs of students (customised courses) has led to a large number of classes with relatively few students in each. This obviously has a huge impact on cost. The need for technology to deliver re-useable modules of training or education becomes evident in this environment.

Attending a technikon/university is not only for the purpose of learning subject content. People do not pay a lot of money to eat at a restaurant just to have a nice plate of food – it is about the total experience. Similarly, many students may attend a

university for the campus experience. Many students are fully aware that the courses that they are studying will not in themselves provide them with the skills they need in the job market. If there is to be a physical campus – the main function of that might be to provide the campus experience. What can/should the new institution do to enhance the total experience?

The results from the exercise performed above, illustrate the potential impact of IT on the HE environment in the future. Similar scenarios have been developed by leaders in education and technology (Twigg and Oblinger, 1996, p.1-19). From the scenarios developed, it is clear that the business opportunities and threats are of strategic importance, and should be addressed by the highest levels of management in the HE institutions. How well are institutions in South Africa doing with regard to IT governance? That is the subject of the next section.

5.5. Maturity of IT Governance in HE in South Africa

PriceWaterhouseCoopers (PwC), an auditing firm, awards an annual PwC Corporate Governance award based on the results of an annual survey of HE institutions in South Africa (PriceWaterhouseCoopers, 2004, p.3). The questionnaire that was sent out during 2004, did not refer to the IT function at all, and no indication of IT maturity could be obtained from this source. This might be an indication that IT governance is not regarded as an important component of HE governance in South Africa.

A survey was conducted to get an idea of the level of maturity of IT Governance in HE institutions in South Africa. A further aim of the survey was to establish what standards or methodologies of IT Governance, if any, were most commonly used in the HE Institutions.

The survey was conducted by means of a very brief questionnaire which was handed personally to IT directors, or their representatives, at a meeting of IT directors of public universities and technikons in South Africa. The meeting was held during October 2003 at the campus of the University of Pretoria. Appendix C is a copy of the questionnaire and a brief description of the CobiT IT Governance maturity model that was handed to each of the IT directors and senior staff from the institutions present at the meeting.

Only the name of the institution was recorded, and the purpose was simply to ensure that duplicate forms from any institution could be identified. Respondents were assured that the information from individual institutions would be kept confidential and that only summarised information would be made available to those interested.

Replies from 14 of the 27 institutions represented were received. Responses from 9 universities and 5 technikons were received. Figure 5.2. is a summary of the responses received. The number in the table represents the number of institutions that selected a particular response to question 2: "At the .. Institution, IT governance or security standards have been adopted to the following extent:"

Standard	Not at all implemented	Planned for next 12 Months	Partially implemented	Fully implemented
CobiT	8	4	2	
ITIL	10	2	2	
BS15000	13		1	
BS7799	12	1	1	
MOF	14			
Other: ISO9001:2000	13			1
Other:				
Total	70	7	6	1

Figure 5.2. IT Governance Frameworks in HE Institutions in South Africa

Only one institution claimed that they had fully implemented a standard, and that is the ISO 9001:2000, which is a quality management standard. The ISO 9000 Quality Series is a worldwide standard that can be applied to any industry (Page, 1998, p.25).

Three out of the fourteen institutions indicated that they had partially implemented one or more of the standards. The total of 6 in the "partially implemented" column in Figure 5.2. is higher than three, as some institutions had partially implemented more than one standard.

The CobiT and ITIL frameworks attract most of the attention, with four institutions indicating that they are planning CobiT implementations within 12 months, and 2 are planning ITIL implementations.

When asked to rate their own institutions according to the CobiT IT Governance Maturity Model, on a scale of 1-5, the average rating was 1.5. The average rating given to the maturity level for the HE Industry in South Africa was 1.4.

The survey was designed to be simple and quick to answer, as it was anticipated that participants would not be willing to spend much effort in completing the questionnaire. The CobiT maturity model was used to measure the overall maturity of the IT governance at the institutions. It may be that a respondent considered the maturity rating with a few processes in mind, for example, the institution may have very rigid policies and procedures and repeatable processes in the area of capital expenditure, and the IT director at that institution may consider that area of greater importance than including other stakeholders in decision-making. This could lead to rating the institution's IT governance maturity higher than it actually is. A further weakness in the survey is that the survey was done by a person from one of the institutions. It is not implausible that a measure of professional pride may have led some respondents to slightly inflate the rating of the institution that they are responsible for. This tendency was slightly compensated for by asking the respondents to rate the HE sector. The fact that the average rating of the institutions by their own IT director is only slightly higher than their rating of the industry overall, is an indication that the rating for the individual institutions were not unduly influenced by the factors mentioned above.

From the above mentioned results the following conclusions can be made:

- The maturity of IT governance of universities and technikons in South Africa is probably close to the CobiT maturity level 1. The CobiT classification at this level is "Initial /Ad Hoc." From the definition of this maturity level, it follows that, in HE in South Africa, there is evidence that the institutions have recognised that IT governance issues exist and need to be addressed. There are, however, no standardized processes, but instead there are ad hoc approaches applied on an individual or case-by-case basis. Management approach can be described as chaotic and there are only sporadic, inconsistent communication on issues and approaches to address them. There may be some acknowledgement of capturing the value of IT in outcome-oriented performance of related enterprise processes. There are no standard assessment processes. IT monitoring is only implemented reactively to incidents that have caused some loss or embarrassment to the organisations (IT Governance Institute, 200d, p.62).

- The awareness and interest in IT governance is increasing with 6 out of 14 (almost 43%) of the institutions indicating that they will be implementing some IT governance framework within the next 12 months from the date of the survey.

- The CobiT framework is attracting most of the attention for future implementation.

Weill and Ross (2004, p.216-220) observed some symptoms of ineffective governance. This survey did not attempt to gather any information in this regard, but where some of these symptoms are observed in HE institutions, the root cause may be poor IT governance. Some of the symptoms include:

- Senior management has a concern about the value of IT investments. Senior managers often react inappropriately by either increasing control, abdicating responsibility to an IT director, or by engaging consultants to "fix the problem."

- Instead of acting as an enabler, IT acts as a barrier, unable to meet changing business needs.

- The mechanisms to make IT decisions are slow or contradictory. For example, the processes of strategic planning are not aligned with the processes for procurement of capital items.

- IT projects often run late and over budget.

- Senior management sees outsourcing as a quick fix to IT problems.

- Governance changes frequently. Management is about what decisions are made. Governance is about who and how decisions are made, and this should not change often.

Considering the high importance of IT in HE institutions, and at the same time the low level of maturity of IT governance in HE institutions as reflected in the survey, it becomes evident that IT governance should receive urgent attention in HE institutions in South Africa. It can be argued that one of the quickest and best ways to improve the situation is for institutions to adopt well established best practice standards of IT governance. There may, however, be a concern that the IT governance standards developed for the corporate and commercial environment may not be suitable in an HE environment. In the following section the applicability of some of these best practice standards in HE will be argued.

5.6. Are IT Governance Frameworks Suitable for use in the HE Sector?

Are the IT governance frameworks used in the corporate and the commercial environments suitable for use in the HE sector? There are many internal controls that are essentially the same in all business organisations (Page, 1998. p.4), and an IT governance framework provides the outline for a generic set of policies and procedures that is required in any organisation. In chapter two of this document, the argument was made that corporate governance principles can be applied with benefit to the HE environment. The fact that the King II corporate governance guidelines have been made mandatory through the Higher Education Act as amended (South Africa, 1997) supports that argument. In chapter three, the relationship between corporate governance and IT governance was established through argument and the literature. In chapter four, several widely used IT governance frameworks were

identified, and these frameworks generally do not make a distinction between corporations and not-for-profit organisations.

It can thus be concluded that IT governance principles, as embodied in the IT governance frameworks, can be applied with benefit in the HE environment. Very often it is simply a matter of changing nomenclature to make the standards applicable in the HE environment (NIST, 2004, p.6). The HE Act (South Africa, 1997) as amended, for example mentions that where reference is made to the "board", in the HE environment it will be understood to refer to the "Council" (South Africa, 2003b, p.18, 21, 26). In a draft standard, "Corporate Governance of Information and Communication Technology", Standards Australia specifically mentions that the standard applies to public and private companies, government entities, and not-for-profit organizations, small and large. The standard notes that in some circumstances, the terminology used within this Standard may require adaptation for example, terms such as 'Boards', 'Directors', 'Shareholders', 'Client' or "Customer" should be taken to mean the equivalent term in each particular organization (Standards Australia, 2004, p.4).

The criteria for selecting the most suitable best practice standards for use in HE institutions in South Africa will be argued in the next section.

5.7. Criteria for the Selection of a Suitable IT Governance Framework for IT governance in an HE Institution.

As discussed in previous chapters, one of the benefits of a common framework is that assurance of quality can be achieved. One of the criteria for selection of a suitable framework would be the approach to quality management followed in the framework. It is therefore valuable to look at the quality assurance approach used by the HEQC. The HEQC has the statutory responsibility to audit the quality assurance mechanisms of HE providers. One of the objectives of the audits is to enable an HE institution to assure itself, its stakeholders and the HEQC that its policies, systems and processes for the development, maintenance and enhancement of quality in all its educational offerings are functioning effectively (HEQC, 2003b, p.i.). The HEQC has not issued any requirements specific to the IT function at HE institutions to date; only general audit guidelines are provided. The HEQC noted vast differences in quality between HE institutions and the concomitant level of preparedness for

internal and external quality management processes (HEQC, 2003a, p.2). Because of these differences, the approach of the HEQC is to focus on the processes, policies and structures related to quality assurance. The HEQC audit does not seek to measure the actual quality of the outputs in relation to teaching and learning, research and service learning. The HEQC focus is on what policies, systems, available resources, strategies and targets exist for the development and enhancement of quality in the core functions of HE, and on indicators of success and evidence of effectiveness (HEQC, 2003a, p.i). What could be suitable indicators of success and evidence of effectiveness that can be used in the IT environment? From the above, it can be argued that a suitable IT governance framework for HE institutions will be:

- More process oriented than prescriptive in nature.
- It will incorporate quality principles such as continuous improvement.
- It will provide guidelines regarding indicators of success and measures of effectiveness.

With regard to standards and statutory requirements for annual reporting by public HE institutions, the Minister of Education issued regulations in terms of the HE Act, 1997 (Act No. 101 OF 1997) which was published in Government Gazette No.25407 on 29 August 2003 (South Africa, 2003b, p.3). This document is called "Regulations for Annual Reporting by Higher Education Institutions." The purpose of the document is to define standards for the content of the annual report of an HE institution to the Minister of Education as prescribed by section 42 of the HE Act, 1997 (Act No 101, 1997). These regulations make compliance with the King Report on corporate governance in South Africa mandatory for HE institutions (South Africa, 2003b, p.21). This requirement can assist with identifying several more desirable characteristics or criteria for a suitable IT governance framework. The seven basic principles of corporate governance (discussed in chapter 2, and again in chapter 3) become important characteristics. These are: discipline, transparency, independence, accountability, responsibility, fairness, and social responsibility (IoD, 2002, p.10-11). Discipline implies a commitment by senior management to adhere to behavior that is universally recognized and accepted to be correct and proper (Heiman, 2002, p.15). Derived criteria for an IT governance framework can thus be, additionally, that he IT governance framework must be internationally accepted good

practice. Transparency implies that the IT governance framework will provide guidelines regarding key performance indicators covering the different aspects of performance. Independence implies that the framework will provide controls so that decisions can be made free from undue influence by, for example a strong IT executive or strong stakeholder. A criterion that can be derived from the accountability principle is that the IT governance framework will provide guidelines regarding organisation structures including committees and the allocation of responsibility. The fairness principle implies that the rights of various stakeholders must be acknowledged and respected and it can be argued that the IT governance framework should therefore recommend mechanisms to limit undue influence of, for example, the chief information officer. The King Report emphasizes that a well-managed company will be aware of, and will respond to, social issues, placing a high priority on ethical standards. It is thus reasonable to expect some guidelines regarding ethics in an IT governance framework suitable for use in a South African context.

In additional to the above, certain obviously desirable characteristics for any framework can be identified, such as that it must be feasible to implement in the South African HE environment. Feasibility might include characteristics such as affordability and simplicity. Demonstrable benefits at HE institutions are desirable. Compatibility with other standards and frameworks is another desirable characteristic.

It can be argued that the portfolio of applications in an HE institution can give an indication of the status of the institution in terms of the three-era model (Ward and Peppard, 2002, p.14-34). This, in turn may be used to select suitable governance best practices. It is proposed that an institution can classify the IT applications in use at the institution using Ward and Peppard's (2002, p.42) applications portfolio model as described in the previous chapter. If the IT organisation of the institution performs mainly a data processing function, or simply provides IT services, it can be argued that a service management framework might add the most value in that environment. If IT is used as a strategic tool in the organisation, the emphasis shifts to IT governance and a framework such as CobiT might provide the most value in that environment.

Having identified some of the more important criteria that can be used in selecting a suitable framework for use in an HE environment, the suitability of the different existing frameworks, such as CobiT, ITIL, BS5000 and SABS7799 can be evaluated.

Figure 5.3 is a summary of some of the most important criteria for selecting a suitable IT governance framework.

Criteria No.	Criteria
1.	The IT governance approach is more process oriented than prescriptive or normative in nature. Institutions vary in size, shape, and may have different objectives, and a normative approach is less suited to such a diverse environment.
2.	The framework incorporates quality principles such as continuous improvement.
3.	The framework provides guidelines regarding indicators of success and measures of effectiveness. These measures allow the institutions to perform benchmarking.
4.	The framework should be recognised as internationally accepted good practice, and should keep up with developments in the governance environment.
5.	Self-assessment is accepted and promoted. The internal quality assurance mechanisms are applied also to the IT function. This approach is supported by the HEQC.
6.	Provides controls so that decisions can be made free from undue influence.
7.	The framework includes guidelines regarding processes that promote ethical behavior.
8.	Feasible to implement in South African HE environment. This implies

	reasonable cost and that it must be simple to implement and understand.
9.	Demonstrable benefits at HE institutions in the world.
10.	Complete. All the major IT processes must be addressed.
11.	The framework must be compatible and able to co-exist with other standards and frameworks.

Figure 5.3. Criteria for Selecting a Suitable IT Governance Framework for Implementation in a South African HE Environment.

5.8. IT Governance Frameworks in HE in South Africa.

How does the international standards such as CobiT, ITIL, BS15000, and BS7799 measure up to the criteria identified above? Figure 5.4. below highlights some of the characteristics of individual frameworks in relation to the criteria selected in the previous section. BS7799 implementation is one of the requirements for BS15000.

Criteria	CobiT	ITIL	BS15000
The approach is more process oriented than prescriptive in nature	CobiT is strongly process oriented.	Process oriented but includes more detailed prescriptions than CobiT. MOF emphasise behavior through the MOF team model.	Strongly Prescriptive.
Framework incorporates quality principles such as continuous improvement	Strongly quality process oriented.	Strong focus on quality.	Strong focus on quality.
The framework provides guidelines regarding indicators of success and	Management guidelines contain clear key performance indicators, key success factors and		

measures of effectiveness.	key goal indicators.		
Internationally accepted good practice	International De Facto IT governance standard.	Internationally accepted service management standard.	British standard, likely to become ISO standard for service management. Identical to South African Standards Organisation SANS 15000-2 / :2004 (http://www.stansa.co.za/icsstandards2.asp?s_id=12334&back=&backpage=icslist2.asp&code=35.020&status=ST)
Self-assessment is accepted.	Self-assessment is made by means of the IT governance maturity model, and other metrics.		Clause 4.1.7. of ISO 17799 explicitly says that reviews can be carried out by an existing internal audit function (Calder and Watkins, 2002, p.54). Certification is done by a third party.
Provides controls so that decisions can be made free from undue influence	Recommends structures and controls from board level down.	More service management than governance oriented.	More service management than governance oriented.
Guidelines regarding ethics	Deals with Ethics specifically (IT Governance Institute, 2000a, p.46).		

Feasible to implement in South African HE environment	Freely available standard and documentation.	Derivates such as the MOF freely available.	Cost of documentation very reasonable.
Demonstrable benefits at HE institutions in the world	Curtin University Australia, since the year 2001 (Bushel, 2003, p.3)		
Complete.	Most complete as an IT governance framework Bushell, 2003, p.2).	Service management standard of great value in IT governance.	
Compatible with other standards and frameworks.	Developed after comprehensive review of world's best practice and professional standards in the area of corporate governance, audit and control, project management, information security, quality management etc. Several mappings from CobiT controls to other standards have been made.	Most IT service management frameworks based on ITIL. Clear overlap and synergies with, for example CobiT.	Requires that BS7799 requirements must be met in the area of security management. Can be used in conjunction with ISO 9000 (Wheatcroft, 2004, p.24)

Figure 5.4. Selected Characteristics of IT Governance Frameworks.

Additional guidance is available from the IT Governance Institute (2004c, p.1-56) that did a comparison of the following standards and guidelines:

- CobiT.
- ITIL – The IT Infrastructure Library.

- ISO/IEC 17799:2000 – Code of Practice for Information Security Management.
- ISO/IEC TR 13335 – Guidelines for the management of IT security.
- ISO/IEC 15408 – Security Techniques – Evaluation Criteria for IT Security.
- TickIT.
- NIST 800-14 – Generally Accepted Principles and Practices for Securing Information Technology Systems.
- COSO – Integrated Framework.

This excellent work describes and compares these products in the following areas:

- Taxonomy – whether it is a national or international standard or a guideline.
- Goals of the standard or guideline.
- Business drivers – what are the typical situations indicating the guidance?
- Risk of non-compliance.
- Target audience.
- Timeliness – is the guidance up to date?
- Certification – what can be certified?
- Completeness.
- Availability – How and where can the information be found?
- CobiT processes addressed – a high-level mapping of the areas addressed by CobiT.

This document (IT Governance Institute, 2004c, p.1-56) also contains a brief description of the guidelines and standards mentioned above. It can be very useful

for anyone (including HE institutions) that is required to make a selection of a suitable set of standards in a particular situation.

Having considered some of the IT governance frameworks, the question may be asked whether specific standards should be adopted or developed for implementation in HE institutions in South Africa. The regulations for annual reporting by HE institutions in South Africa states that the autonomy that public HE institutions enjoy makes it important that the structures of governance and management of these institutions account to both internal and external stakeholders in a consistent and prescribed manner. The developments in Annual Reporting and the emphasis on "harmonisation" both nationally and internationally, require that Annual Reporting should comply with generally accepted practice (South Africa, 2003b, p.17). The desirable characteristics of reports by HE institutions to the DoE include (South Africa, 2003b, p.22-23):

- Understandability.
- Relevance.
- Materiality - Information is material if its omission or misstatement could influence decisions of users taken on the basis of the information.
- Reliability – reliability include completeness, faithful representation and prudence.
- Comparability - the reports should enable comparative evaluations of different enterprises and of the same enterprise over time. This is reliant on the application of the concept of consistency in preparation over time.

In the area of financial reporting, this is achieved through conforming to the SA Gaap reporting standards, and some additional standards defined by the DoE. It can be argued that reporting related to IT resources will more likely conform to the requirements stated above if a common standard is used for reporting on IT resources. According to the DoE guidelines, council is required to make a statement regarding corporate governance that reads similar to the following: "Council recognises the need to conduct the business of the HE institution with integrity and in accordance with generally accepted practices" (South Africa, 2003, p.28). The

regulations does not call for any specific generally accepted practice in IT governance to be adhered to, but it does highlight the importance of accounting to stakeholders in a consistent and prescribed manner. The value of aligning with international standards is also alluded to. It may thus be wise for HE institutions to start initiatives to implement an internationally accepted IT governance best practice framework such as CobiT.

The DoE does require HE institutions to be audited annually by an external auditor, and the auditors are required to make certain statements regarding controls in the institution (South Africa, 2003b, p.20). On January 1, 2005 the Auditing and Assurance Standards Board (AASB) of the Public Accountants and Auditors Board (PAAB), a statutory body in South Africa, will adopt the entire suite of standards of the International Auditing and Assurance Standards Board (IAASB) of the International Federation of Accountants (IFAC). The IAASB is promoting convergence with international standards globally, and the adoption of the IAASB standards is a move towards adopting the International Financial Reporting Standards (IFRS) (PAAB, 2004, p.1). These standards, in turn are largely influenced by the United State's Sarbanes Oxley Act of 2002 (Agulhas, 2004, p.5). It can thus be expected that the auditors of South African institutions will increasingly be concerned about internal controls that support the financial function, and will be required to report on these controls, including the IT controls.

It can be argued that the benefits that can be expected from adopting best practice standards in IT governance in South Africa will include most of the generic benefits to organisations that was identified in the previous chapter.

It is not necessary to implement all aspects of, for example, CobiT to derive much benefit from the best practice framework. CobiT can be used as a roadmap for continuous improvement. The framework incorporates so many different professional standards, that an HE institution can look to it for best practice guidance in about any area of IT improvement (Bushell, 2003, p.2). At one HE institution in South Africa, a decision was made to compile a checklist based on the CobiT processes. The checklist would be used as part of the due diligence exercise during the IT merger process of two of the HE institutions (Personal communication, Mr A.

Schonken, Chairman of the joint IT merger task team of the NMMU, South Africa, 2003).

Similarly, an institution that has a problem in a specific area of IT governance, for example in the area of information security, may decide to implement a focused information security standard such as ISO 17799. Calder and Watkins (2002. p.24) argue that the most practical and effective way for directors to handle their information security risks, is to adopt and implement an information security policy and information security management system based on ISO 17799.

5.9. Adapting Industry Best Practice for use in HE

The term framework, as also used in the term "IT governance framework", implies that content must be added for its use in an organisation. It is, for example not possible to define an information security architecture that is suitable for all HE institutions. Likewise, in the HE environment, while many of the same approaches and principles will be applied that will be used in many other organisations, some adaptations will be appropriate. For example, traditional network design has focused on creating a secure network perimeter, and placing a firewall at the point where the network is connected to the Internet (Suess in Luker and Peterson, 2004, p.74). This design is problematic in an HE environment where many users are likely to need access to a number of resources inside the HE network. Further, it is likely that many machines in the network cannot be trusted. In this environment, the general approach of using firewalls is still appropriate, but it may be necessary to use additional firewalls between the administrative servers, and the resources used by students. In a similar way, tools and techniques such as virtual private networks, intrusion detection and intrusion prevention are often used in HE institutions, but the architecture will be appropriate to the assets that must be protected and the threats to those assets.

Recognising the need for different organisations to easily adapt a framework for internal use, the IT Governance Institute has developed a tool referred to as "CobiT Online" (IT Governance Institute, 2004b, p.52). This product allows users to customize a version of COBIT for their own enterprise, store and manipulate that version as desired, and offers online, real-time surveys and benchmarking.

The organizational structures found in HE institutions differ somewhat from that which is found in non academic environments. How this impacts on IT governance in HE is briefly explored in the following section.

5.10. IT Governance Structures in HE

Governance consists of the leadership, organizational structures, direction, and processes that ensure Information Technology (IT) sustains and extends the enterprise's mission, strategies and objectives in a planned manner (NASCIO, 2002, p.26). In the previous section the IT governance processes and the process oriented governance frameworks were highlighted. It is also important to explore the IT governance organizational structures in HE. Organisational structure is a key element of governance. An organizational structure provides the framework within which decisions are made. The work of the organisation is divided so that each manager has the authority to act in a given area of activity such as sales, marketing, manufacturing, finance, quality control and information systems management. The effectiveness of the organisation then depends on having competent, honest employees that create an appropriate control environment. A good control system can assure that commands are being carried out, and can warn when changes in the environment require changes to the policies and procedures (Page, 1998, p.4-5). Key decisions relating to the IT governance structures may include the following:

- Should the IT function be centralized or decentralized?
- What resources, if any, should be outsourced?
- What committees should be established?
- What responsibilities must be allocated to whom, and how will performance be assessed?
- What should the security organisation consist of, and to whom should it report?

Centralised vs. Decentralized IT Organisation.

By far the majority of the South African HE institutions have an IT director or equivalent with the main responsibility of providing the institution with an IT infrastructure and support (Moller, 2004, p.64, 65). In many cases a hybrid model is followed where, for example, faculties will provide certain services to their own staff and students, while relying on other services to be provided by a central IT group (Moller, 2004, p.64). These findings are in line with the finding that the dominant model in many contemporary organisations is a federal model (a hybrid design of centralised infrastructure control and decentralised application control), as this may offer the benefits of efficiency and standardization under centralised control, but effectiveness and flexibility of decentralised application control (Peterson, 2004, p.56). Weill and Ross (2004, p.81) observed that not-for-profit and government organisations rely more heavily on federal models for business application needs decisions than commercial organisations. A simple matrix model that is described in Ward and Peppard (2002, p.48-50) is useful to explain the different levels of centralization of organisation structures, and also to assist top management when making decisions in this regard. The two dimensions of the matrix are **infusion** and **diffusion**. Infusion refers to the degree to which an organisation becomes dependant on IT to carry out its core operations and manage the business. Diffusion refers to the degree to which IT has become dispersed throughout the organisation and decisions concerning it are devolved. The quadrant in the model that fits organisations with a high level of infusion, as well as a high level of diffusion, is referred to a complex organisation. As evidenced by the analysis of the breadth and depth of computer applications in HE institutions, most of the HE institutions in South Africa will fall in that quadrant of the model. The business depends on the systems for success, but the applications are also distributed through the organisation. This is a complex environment to manage. It requires senior managers to make key decisions, rather than allowing local business managers total discretion, or allowing the IT department to control the investment. Too much central control to avoid poor investment and duplication of effort may limit innovation and lead to lost opportunities in specific business areas (Ward and Peppard, 2002, p.48-50) and it may be correlated to IT making a low contribution to the business because it is too occupied with its own internal concerns (Gottschalk, 2004, p.248). Weill and Ross (2004, p.81) observed a tendency towards IT governance structures best described as

“monarchies” in government and not-for-profit organisations. It is explained that these monarchies are better able to deal with multiple and often conflicting objectives, such as are often found in that environment. Highly centralised management is generally less effective in rapidly changing competitive environments (Hall and Symes, 2003, p.14). The IT environment in HE is a rapidly changing environment as compared to the broader HE environment in which it operates. This poses an additional challenge to the IT function within the HE environment.

Some of the differences in the structure of HE organisations and corporations were identified in chapter 2. This has some implications on the location and structure of the IT organisation within HE organisation, and may require different coordinating mechanisms. One of the most notable characteristics of an HE institution is the bi-cameral governance structure of council and senate in HE institutions. Both the administrative components as well as the academic components of the organisation are very dependant on technology for the execution of their functions, and many more opportunities for the application of technology exist in both these areas. The most common coordinating mechanism used in public institutions is committees. It can therefore be argued that a strategic planning committee that deals specifically with the application of technology in education delivery should report to the senate of the institution. The placement of the IT governance components in an HE institution may thus be depicted in the graphical model (Figure 5.5.) below.

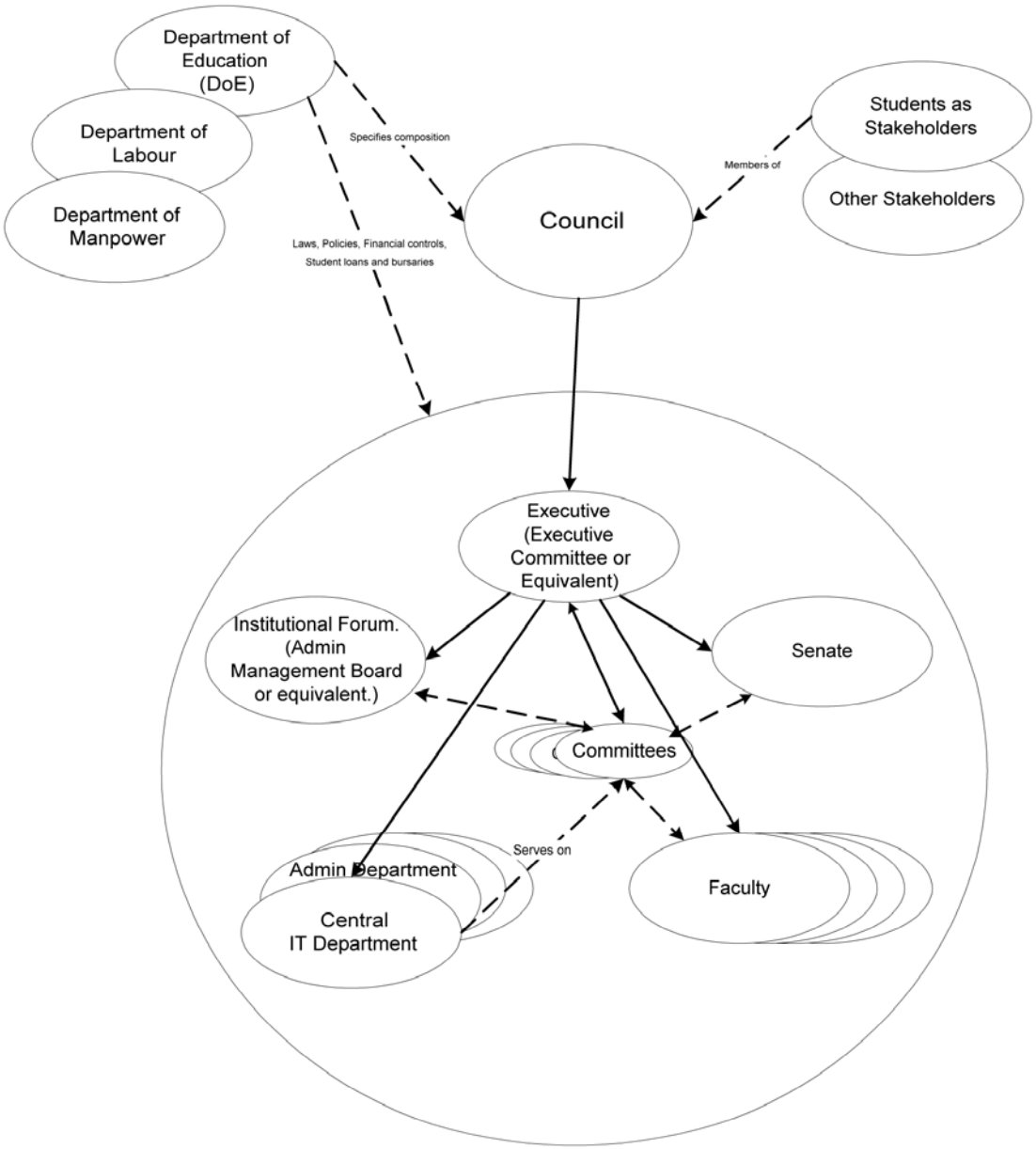

Figure 5.5. Governance Structures in HE Institutions.

The DoE and other government departments influence the composition of the HE institution's board, and use policies, funding and structures such as the HEQC to influence and control the HE institutions. The council (acting in a similar way as the board of a corporation) includes representatives of students, staff, industry and other stakeholders. Some committees may be shared committees of the council and the executive. Examples of shared committees might be a finance committee, and an audit committee.

The CobiT (IT Governance Institute, 2002) recommendations include that the IT Strategy Committee is composed of a chairperson, several board and non-board members and ex-officio representation of key executives. The chairperson should be

a board member. The members should be selected on the basis of their knowledge and expertise in understanding the business impacts of information and related technology. Queensland University of Technology, Australia, for example, has an extended management group consisting of the vice-chancellor, the deputy vice chancellor, and a few IT specialists that meet monthly with the purpose of setting strategy and investment priorities. Other universities in Australia have similar structures (Bushell, 2003, p.4,5). A CIO at one of these universities highlighted a benefit of this top-level strategy committee. He noted that, even in very harsh economic conditions, he received budget allocations that he would not otherwise have obtained in his position as CIO (Bushell, 2003, p.6).

Van Grembergen, De Haes and Guldentops (2004, p.23-24) suggest that the detailed implementation of the IT strategy will be the responsibility of executive management, assisted by one or more "IT steering committees." The steering committees may have responsibilities such as steering major projects, managing IT priorities, cost, allocation of resources etc.

One of the key recommendations from CobiT (IT Governance Institute, 2000a, p.41), as well as other security codes, is security organisation. A security organisation with roles and responsibilities proposed by BS7799 include (Calder and Watkins 2002, p.37-46):

- Management – has ultimate responsibility for the management and implementation of information security. In an HE institution this is the principal.

- Information security officer – has responsibility for the development and implementation of security such as assisting owners in assessing risks and defining security guidelines with owners, advising on security issues, investigating suspected security incidents.

- Owners – have direct responsibility for the day-to-day implementation of security.

- IT Management – has responsibility for development, implementation, management and maintenance of IT facilities and systems.

- Users – must be aware of their responsibilities relating to information security, and be responsible for their actions.

- Auditor – must be an independent person (either within or outside the organisation) who conducts reviews to provide assurance that information security policies and processes are complied with.

In a survey of HE institutions, the P.E. Technikon is one of the two institutions that indicated that they had partially implemented the BS7799 guidelines. The information security organisation at this institution is briefly described below, as an example of what the security organisation at an HE institution might look like. An information security committee, as a coordinating body consists of the IT director (chairman), the information security officer (part time duty of one of the members of staff reporting to the IT director), the head of academic administration, the head of finance, the head of the human resources department, a legal expert from one of the faculties, a well known professor in the field of information security, a systems engineer with wide responsibilities in the area of information security, and the head of security services at the institution. This committee meets quarterly and reports to the Institutional Forum (referred to as the Administration Management Board in the case of the P.E. Technikon). A recent project done to assess the efficiency of the security management system at this institution highlighted some weaknesses such as an apparent lack of commitment by some members of the committee. The mere fact though, that the minutes of this committee serves at the institutional forum (statutory body as described in chapter 2), creates an awareness of information security related issues with top managers, and serves as an incentive for individuals to execute fully the tasks that flow from the committee's activities. This structure has proved to be very useful at the PE Technikon (Personal Communication, Ms A Moller, P.E. Technikon, October, 2004).

The internal organisation of the IT function will vary but a typical example is illustrated in figure 5.6. (Gottschalk, 2004, p.251). In an HE environment, the chief Information Officer (CIO) might be a Deputy Vice-Chancellor, with additional responsibilities. Gottschalk (2004, p.253) noted that the CIO should report to the chief executive officer, or to someone who reports directly to the CEO.

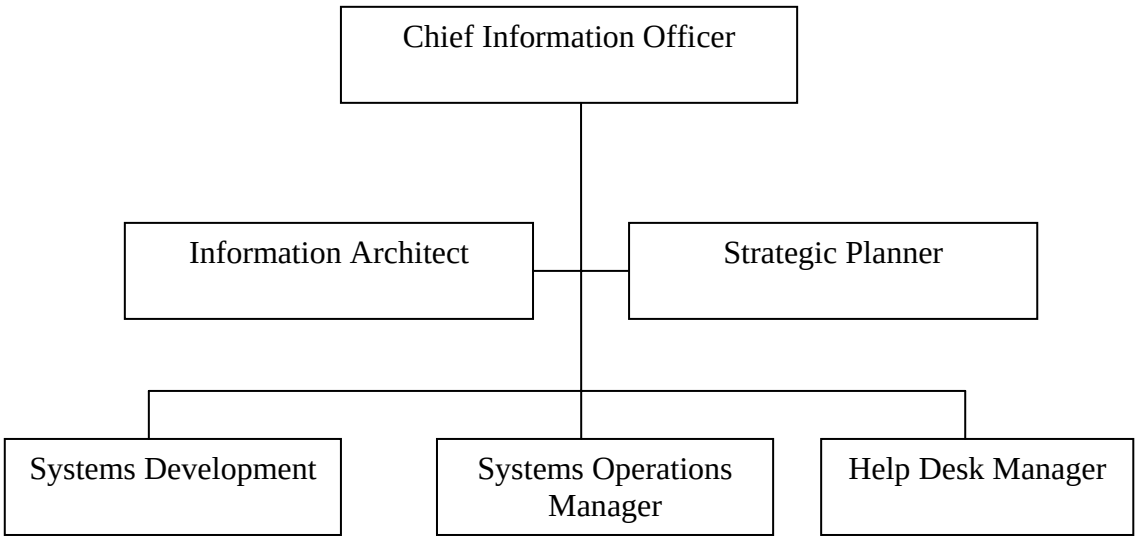

Figure 5.6. Internal Organisation of the IT Function (Gottschalk, 2004, p.251)

Many HE institutions have seen the creation of a new senior-level position, often referred to as the chief information officer (CIO) (Penrod, 2003, p.1; Gottschalk, 2004, p.253). The CIO plays a very important role in IT governance, particularly in his role as business strategist.

The value and potential value of inter-institutional co-coordinating bodies are well illustrated by a not-for-profit organisation in operation in South Africa called TENET. TENET was founded in by the Committee of Technikon Principals (CTP) and the SA Universities Vice-Chancellors' Association (SAUVCA). TENET is run by a board of directors, appointed by CTP and SAUVCA. TENET's main purpose is to secure, for the benefit of South African universities and technikons, Internet and information technology services (TENET, 2004, p.3). In effect, TENET governs the size and shape of the HE national and international computer networks. The co-operation of the institutions through this structure has led to very significant savings on the cost of network lines and services to the institutions. TENET has been able to obtain millions of Rands of donor funding, which individual institutions might otherwise never have been able to access. This organisation manages services for the entire public HE sector such as domain name services (DNS). The entire South African HE computer network is able to function better because of international network traffic caching and filtering of unsolicited email (SPAM). TENET also runs

a program, referred to as DITCHE to enhance capacity in the technical domain as well as in the effective use of technology in teaching and learning. Under the banner of the DICHE program, training seminars and events are organised to facilitate the transfer of information and good practice between staff from the different institutions (TENET, 2004, p.17-19)

One of the key decision areas in an HE institution is how the IT function will be resourced. The options of insourcing, outsourcing and hybrid combinations of these options were briefly described in chapter three, and the general conclusion was that outsourcing is associated with a high risk of failure, and that strategic applications should not be outsourced. It is particularly important to properly handle the employees of IT contracting companies to ensure that information security controls are not bypassed or undermined by sub-contractors (Calder and Watkins, 2002, p.85,89; Beulen, 2004, p.313). It was noted that even with complete outsourcing, there are vital competencies that must be maintained in-house to monitor and manage the contractual relations, track, assess and interpret changing IT capability and relate them to organisational requirements, and to define IT requirements over time (Ward and Peppard, 2002, p363). One of the fundamental issues that must be addressed in any outsourcing decision is the basic contrary goal of cost saving of the outsourcer and the return on investment goal of the IT provider (Beulen, 2004, p.312). Suomi and Tahkapaa (2004, p.371-372) highlighted some governance issues related to outsourcing, such as that the outsourcing organisation loses a part of control over the IT function. Other issues related to trust, such as opportunism and moral hazard, make outsourcing more difficult to control than internal resources. HE institutions in South Africa (with the exception of the distance education institutions) operate in fairly well defined geographical areas with relatively few campuses. The IT departments at HE institutions are relatively small. Considering these factors, it can be predicted that with good IT governance in place, high levels of outsourcing will not occur in HE institutions in South Africa. Thus, for example, the person with sufficient skill to manage a contract for a specific service, such as messaging, may very well have sufficient skill to manage the service itself, with very little additional assistance. A central, in-house service, such as a centrally managed email service, benefiting from the economy of scale, could be very effective. A service such as email could be regarded as strategic in an HE environment where the system can be

used for strategic marketing, used to foster the client relationship, used to receive and send educational materials, and used strategically to reduce the time from invoicing to payment, and to keep the cost of distribution of communications (such as invoices, statements, etc.) with students low.

5.11. Conclusion

There are several compelling reasons that make good IT governance in HE an imperative. These include: the huge opportunities for the application of IT in HE; the serious risks associated with IT in HE; and the statutory obligations that HE institutions must comply with. It was concluded that these factors driving the need for good IT governance in HE will increase in importance over time.

A low level of IT governance maturity was observed in HE in South Africa. A survey based on the capability maturity model was used to demonstrate the low level of maturity of IT governance in HE institutions in South Africa.

It can be concluded that the observed level of IT governance in HE in South Africa is not commensurate with the level required. That leads to the question about what should be done.

A set of criteria was developed to assist with the selection of a suitable IT governance standard in the HE environment. These criteria were applied to some of the most prevalent IT governance frameworks, and it was established that several of these can be used to make a significant contribution towards improving the level of IT governance in HE institutions.

It is postulated that the problem of IT governance maturity levels in HE in South Africa not being commensurate with the levels required, can effectively be addressed by adopting a suitable IT governance framework, such as CobiT, which embeds much of the best practice recommendations of several earlier frameworks. CobiT is an overall IT governance framework, which means that it addresses al the major generic processes found in an IT environment. The institutions that use the CobiT framework can put greater emphasis and expand on certain processes as required. As a result of the fact that CobiT is process oriented, it is not prescriptive regarding organization structures, or how specific processes should be implemented. ITIL or

MOF guidelines can, for example, be used to implement change control in the IT environment. Likewise BS7799 guidelines can be used in the area of information security. While CobiT will not prescribe a specific standard, following CobiT guidelines will ensure that that a process will be followed that may lead to such a decision.

The need to customize the international guidelines for application in an HE environment, and the potential for co-operation between HE institutions in this regard as illustrated by the TENET initiative were highlighted.

Business alignment is a key objective of governance. This means that business goals, processes and structures should be aligned. The purpose and goals of HE institutions were identified in chapter two, and are in line with the World Declaration on Higher Education, which states that core missions and values of HE are to contribute to the sustainable development and improvement of society as a whole. This is done through training and educating responsible citizens with a world wide vision to meet the need of all sectors of society, and by advancing, creating and disseminating knowledge through research (UNESCO, 2000, p.72). In this chapter the essential role of IT in assisting the HE institutions to meet these objectives were highlighted. Several mechanisms and tools to facilitate alignment between these business objectives and the IT function have been identified. These include organisational structures such as committees, and tools such as the balanced scorecard and the portfolio approach to selecting IT projects. One of the most important factors that determines who makes what decisions, and how decisions are made (the key governance issues), is the organisational structure. For this reason, recommendations regarding specific committees and organizational structures in HE were made. The governance decision regarding sourcing of IT resources in an HE environment was addressed and factors supporting the decision of most HE institutions in South Africa to centralize the IT function, and to support it with in-house resources were highlighted. The balanced scorecard was identified as one of the most practical models to use (also in and HE environment) to achieve strategic alignment between business and IT (Van Grembergen, De Haes and Guldentops, 2004, p.10).

"After 40 years of unbelievable progress, computer technology has finally reached its infancy!" (Grulke and Silber, 2000, p.14)

Chapter 6. Conclusion and Recommendations.

6.1. Introduction.

In the preceding chapters, the hierarchy of governance, as it affects IT in a HE environment, was discussed. In chapter five, specific recommendation regarding IT governance in HE were made. This chapter will summarise the most important findings and recommendations from the previous chapters. The results and recommendations are discussed in the light of the original objectives for this treatise. Expected future developments and areas for future research will be recommended.

6.2. Discussion of Objectives and Results.

The primary objective for this study has been to identify suitable IT governance frameworks for use by HE institutions in South Africa. In order to do that, some secondary objectives defined were:

- To research and describe the environment in which IT governance operates with reference to the relationships between corporate governance, HE governance and IT governance.
- To demonstrate the need for good IT Governance in HE.
- To establish the current level of maturity of IT governance in the HE environment.
- To model the relationship between the most commonly used best practice recommendations and processes with regard to IT governance.

The need for good IT governance in HE was argued on the basis of cost, value, opportunities and risks emanating from the use of IT in HE. IT governance is recognized as probably the most important determinant of IT value realization (Peterson, 2004, p.37). The value risk and opportunities arising from the use of IT were argued for enterprises in general in chapter three, and in the IT sector

specifically in chapter four. Porter's value chain model was used to identify and classify some of the important areas where value creation is enabled by means of Information Technology in HE. The risks associated with the use of IT in the HE business were demonstrated by identifying assets that are of value to the institutions, including intangible assets such as reputation and trust. From the literature some of the major threats to HE institutions were identified, and these included aspects such as the position of HE networks in global warfare and espionage. From sampling the TENET computer network, used by virtually all HE institutions in South Africa, by means of intrusion detection software, the volume and range of threats due to malicious software to HE institutions were demonstrated. The conclusion is self-evident: good IT governance is an essential and highly important element of good HE governance.

To establish the current level of IT governance maturity in HE, IT directors or the equivalent of HE institutions were invited to rate the maturity of the IT governance in their institutions using the CobiT maturity model. A maturity model can be a very comprehensive tool to benchmark the organisation through time or against other organisations (Van Grembergen, De Haes and Guldentops, 2004, p.13-15). The result of this assessment places the maturity level in HE in South Africa at a level of between 1.4 and 1.5. A survey conducted by the Information Systems Audit and Control Association (ISACA) during 2002, using the same tool, concluded that the average maturity level across several industries was between 2 and 2.5. (Van Grembergen, De Haes and Guldentops, 2004, p.13-15). Evidently, the maturity of IT governance in HE is not at the level that it should be.

The different views of what governance entails, and the overlap and differences between management and governance were explored in the second chapter. The purpose was to research and describe the environment in which IT governance operates with reference to the relationships between corporate governance, HE governance and IT governance (secondary objective no i.). Examining governance principles, structures and processes in the more mature area of corporate governance, proved to be of assistance when exploring the newer discipline of IT governance. The rationale is that when IT business alignment and IT governance are examined, it is very important to consider the goals, structures, processes and governance mechanisms used by the organisation as a whole. Particularly in HE, where the

government seeks to play an active role and seeks to control the size, shape and goals of the public HE sector, is it important for senior IT managers to consider the goals and governance mechanisms imposed by law, as well as the different government structures. The conclusion that was reached by comparing HE governance with corporate governance is that, even though there are some differences between the different types of organisations, the principles of good corporate governance apply also to HE governance. Peterson (2004, p.72) and the IT Governance Institute (2000c, p.28) supports the conclusion that IT governance can be described as corporate governance focused on IT. This argument is also supported by the fact that the King II recommendations for corporate governance have now become a statutory requirement for HE institutions.

The fourth, secondary objective of this study was to model the relationship between the most commonly used best practice recommendations and processes with regard to IT governance, and to find their most outstanding characteristics. This was done so that criteria for selecting suitable frameworks could be identified, and to see which, if any, of these frameworks would be suitable for use in HE in South Africa. The three-era model described by Ward and Peppard (2002, p.22-59), in combination with the historic perspective of IT governance models by Sallé (2004, p.1,9), shows the relationship between the different models from a historic perspective. This, in turn, makes the distinction between a framework with an emphasis on service management (such as ITIL) and a more modern framework with emphasis on IT governance (such as CobiT), clearer. A further model that was used to show the relationship between the different frameworks and standards along functional lines was described by Sallé (2004, p20). A third set of models reported on in this document consists of mappings between the different frameworks and standards. The conclusion reached in chapter four was that these frameworks should be regarded as complementary, with different focus areas. IT governance, for example, with an emphasis on the strategic use of IT (governance issue) is not possible in an environment where the IT services are not reliable (IT service management issue). From another perspective, the frameworks are complementary, for example, CobiT places an emphasis on what needs to be done (a high level framework) while ITIL often explains in detail how it is to be done (Van Grembergen, De Haes and Guldentops, 2004, p.27).

Having addressed the secondary objectives, it became possible to consider the primary objective which was to identify suitable IT governance frameworks for use by HE institutions in South Africa. After comparing the need for good IT governance in HE with the low level of maturity, it becomes evident that action is required to raise the level of IT governance in this sector. A set of criteria that may be used to assist HE organisations in selecting an IT governance framework, or components thereof, was developed using inputs from the dominant corporate governance framework in South Africa (King II), the quality framework used by SAQA, and other desirable characteristics identified from the literature. These criteria were applied to some of the most notable IT management and governance frameworks, providing a useful reference for HE institutions in South Africa interested in improving their IT governance. The clear conclusion was that CobiT addresses all the most important requirements for a high level IT governance framework, and that it is suitable for implementation in an HE IT governance environment.

6.3. Additional Findings and Recommendations.

The most important conclusion is that when IT governance is well deployed, it results in many business and IT benefits. Effective IT governance ensures that IT supports business goals. It results in better returns on IT investments. Good governance ensures that IT risks are appropriately managed, which protects the stakeholders. The need to adhere to a high standard of generally accepted good governance practices was highlighted. Assurance that good governance principles are applied adds value to the organization because trust in the organization increases. The same conclusion was reached by several authors (Callahan, Bastos & Keyes, 2004, p.346).

Significant benefits associated with the application of technology in business are usually only realized if they are accompanied by changes in business processes. This requires the involvement of top management, and requires mechanisms to facilitate cooperation across functional business areas. It can be argued that unless these governance mechanisms are well established, major process innovations in the HE environment will be limited, and the return on IT spending in this environment will be low. This is an important reason for IT governance in HE to improve.

The relationship between corporate governance and IT governance was highlighted. The IT function can be regarded as a business inside a business with appropriate strategic committees performing the function of a board to the IT business. A different perspective of IT as a valuable resource that must be governed in the same way as the other resources (such as HR and finance) by the board and executive management of the organisation as a whole, was also identified. The first view fits well with IT as a service function, and the organisation "buying" services from IT as a strategic business unit, or as a strategic partner. Alternatively, IT can be viewed as an integral part of the business, and that good governance, rather than management of a service agreement, is required.

One of the issues that arise in organisations revolves around an appropriate organisation structure for the IT function. Several different studies indicate that the federal IT governance model has emerged as the dominant model in contemporary organisations (Peterson, 2004, p.56). It can be argued that, especially in the academic environment, a command and control approach to IT governance will not be as effective as what Peterson (2004, p.72) describes as "a network of multiple business-IT collaborative relationships based on competencies and flexibility." This approach is well supported by the Microsoft Team Models described in chapter four, and it is proposed that this is a suitable model for use in the HE environment.

Various frameworks for IT governance were discussed and the two main approaches to governance and quality management were identified; the normative approach and the more process oriented behavioral approach. The argument was made that in a new and rapidly changing environment, such as the IT environment, appropriate processes and behaviors are more important than the more normative specifications.

Ethical behavior was highlighted by the King II report, and is also an important element of the CobiT framework. Emphasizing an ethical, principle based approach in business processes has the advantage that it becomes applicable to a wide range of environments and situations, and remains valid over time. There is little doubt that the amount of attention that corporate governance has recently received is to a large extent a response to major scandals in the corporate environment. There is no doubt that technical controls are extremely important to limit unethical behavior. One could argue, though, that the behavioral approach, emphasizing the importance of

ethical conduct, is even more important in any business. Good work ethics and a culture that values information security, is essential to productivity and information security.

A number of valuable models, tools and techniques that can be used in IT governance have been identified or used. Some of these include: several corporate governance standards; several quality frameworks including Baldrige and ISO 9000; several IT governance and service management frameworks and models; the Application Portfolio Matrix; Microsoft risk and team models; balanced scorecard; maturity models; Porter's value chain model. These tools are valuable for managers to compare, analyse, categorise and diagnose situations and to support decision making.

The value of CobiT for the purpose of directing, managing and controlling IT processes, was established. The principles of quality management embedded in the framework ensure continuous improvement in the environment where it is implemented. Implementing a framework such as CobiT should thus make it easier for an institution to obtain additional relevant ISO certification (e.g. ISO 17799, ISO 9000 or BS15000).

It is recommended that CobiT be accepted as a standard approach for IT governance in South African HE. It could be used with benefit as a guideline by SAQUA to evaluate the IT services of HE institutions in South Africa. CobiT is an overall IT governance framework, incorporating best practice from a number of more specialised standards.

It is anticipated that IT governance as a discipline, and CobiT as a governance framework will be widely implemented in corporations worldwide. This will create a growing need for individuals skilled in the use of CobiT. The HE institutions would benefit significantly from using this widely accepted standard to define their own IT governance processes, but they can also contribute to meet the manpower skills by incorporating CobiT as part of the curriculum for graduates.

6.4. Areas for further investigation.

One of the notable differences between HE institutions and most other institutions is the bi-cameral arrangement with a senate responsible for academic matters. Should this structure also affect IT governance in an HE institution? Should a committee, similar to the strategy committee for IT in general, perform similar functions in the area of academic use of IT?

E-learning has become a critical area in HE institutions. Is a framework such as CobiT suitable for governing e-learning resources in much the same way as it provides a framework for generic IT governance in an organisation? It appears that CobiT can be applied to an application area, such as e-learning, to improve the quality and reliability of processes and the creation of value for the stakeholders. This might fill a need in many institutions where they are more concerned with governing the core area of IT in teaching and learning than the IT function in general.

Suomi and Tahkapaa (2004, p.377) observed that trust is a concept that is currently heavily studied, but seldom in the field of governance structures and relationships. "Trust belongs to those technologies, like the telephone, information technology and money itself, which reduce the cost of organising by making exchanges more efficient" (Suomi and Tahkapaa, 2004, p.364). One might get the sense that the focus of current governance literature has been on controls and formal mechanisms. It can be postulated that informal relationships, based on trust, and their dynamics and drivers in an organisation is an important area for further investigation. Would HE institutions, for example, benefit more from investing in developing a culture of good ethical behavior rather than investing much more effort in technical and management controls? Researchers in the automobile industry found that high levels of technology without innovation with human resources, led to poorer performance than through innovation by means of human resources only (Davenport, 1993, p.234). The Microsoft team model places a lot of emphasis on roles and accountability to peers and team members rather than hierarchical position in the organisation. Might this model of self-regulating teams based on trust and competencies, working directly with the stakeholders, become the dominant governance mechanism in the future?

More work is required to customize the implementation of CobiT control objectives for individual processes in organizations. Control objective number P01 is to "define a strategic Information Technology Plan." Detailed control objective number 1.1. reads like a policy statement stating that senior management is responsible for developing and implementing long- and short-range plans that fulfill the organisation's mission and goals, and that they should ensure that IT issues and opportunities are adequately addressed in the organisation's plans. Item 1.2. states that IT management and business process owners are responsible for regularly developing IT long-range plans (IT Governance Institute, 2000a, p.33). What process should be followed to develop such strategic plans? The process may differ somewhat in different institutions, but a well proven approach, such as the one proposed by Ward and Peppard (2002, p54), and a basic structure of such a strategy document as proposed by the same authors (Ward and Peppard, 2002, p.165-166), adapted for use by HE institutions, may be of value to many institutions. Similarly, cooperation between institutions to develop policies, processes, template documents, forms, metrics and systems may be of great value to the public HE sector in South Africa as a whole. Using a well researched and well established framework, such as CobiT, provides the assurance that the additional work done to give substance to the framework, has a sound basis, and that all the major generic areas of IT governance have been addressed.

This report did not address major opportunities for co-operation between institutions enabled by ICT. The definition of IT governance that was used is the one by the IT governance Institute: "A structure of relationships and processes to direct and control the enterprise in order to achieve the enterprise's goals by adding value while balancing risk versus return over IT and its processes" (IT Governance Institute, 2000a, p.5). It can be argued that much benefit can be derived if a set of relationships and processes to direct the HE sector in South Africa, in order to achieve the national goals by adding value while balancing risk versus benefit over IT and its processes, is defined. What structures, processes (including policies and procedures) and other governance mechanisms would be appropriate to gain a much greater synergy between institutions? It can be postulated that if many institutions in South Africa adopt an IT governance framework such as CobiT, a greater level of trust between the IT departments of institutions will develop, a common vocabulary

will lead to better communication, benchmarking and assessment will become easier in the industry, and South African HE specific best practice will develop as the principles of continuous improvement are applied.

Patel (2004, p.92) suggests that global e-business IT governance requires a distributed and decentralized model, like the ones used to develop the Internet, web and Linux to develop systems. Would a similar approach be suitable in HE? What governance mechanisms will be most appropriate in this environment?

6.5. Conclusion

The discipline of IT governance is yet in its infancy, and it has been suggested that the IT governance paradigm might more suitably be based on the principles of collaboration, competency and flexibility than on control, authority and efficiency (Peterson, 2004, p.73). Collaboration, competency and flexibility are particularly important in complex and uncertain environments, such as the IT environment.

There is little doubt that there is a great need for HE institutions in South Africa to improve their IT governance. Institutions can derive much benefit from improving their IT governance, and adopting and adapting a well researched and well recognised IT governance framework, such as CobiT.

Will technology and the associated practices change in the future? In the year 2000 futurologist Wolfgang Grulke observed: “After 40 years of unbelievable progress, computer technology has finally reached its infancy!” (Grulke and Silber, 2000, p.11).

In conclusion, the advice of a wise ancient governor (King Solomon) is more relevant than ever: “To the making of many books there is no end, and much devotion to them is wearisome to the flesh. The conclusion of the matter, everything having been heard, is: Fear God and keep his commandments. For this is the whole obligation of man. For God himself will bring every sort of work into the judgment in relation to every hidden thing, as to whether it is good or bad” (Ecclesiastes 12:11, The Bible). Much has been said, and will undoubtedly yet be said regarding education, corporate governance, IT governance, ethics and appropriate behaviors.

Good governance rests, with reference to the words above, on the principles of accountability, ethical behavior, responsibility, transparency and what is fair and just.

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Appendix A.

An analysis of the value added functions of IT in HE using Porter's Value Chain Model.

Porter's traditional Value Chain Model (Porter, 1986, p.18) is used to identify some of the most obvious existing and potential IT applications that may add value in the HE environment. The education industry is interesting because the student can be regarded as both the customer and the product.

Value Chain (Porter, 1986, p.18).

The model is used to evaluate how the activities of the organization contribute to the value offered to stakeholders (customers) through products and services. (Harding and Long, 2001, p.191-194). A visual representation and explanation of the Porters Value Chain model is presented below as figure 5.1.1.

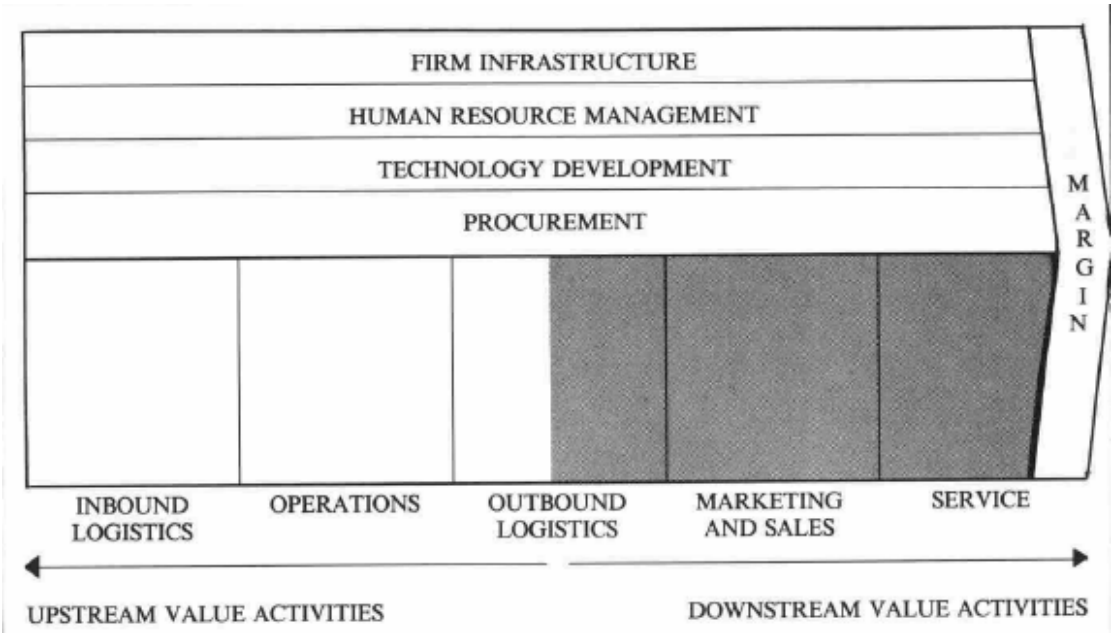

Figure A.1. Value Chain Model (Porter, 1986, p.18)

Various sources may be used to determine what is of value to the different stakeholders. The world declaration on higher education states that the mission of HE

is to educate, to train and to undertake research (UNESCO, 2000, p.72). This is supported by value statements and objectives that have been published for the HE sector in South Africa by the Department of Education (DoE). Unfortunately more detailed information on what is really of value to the stakeholders and in the industry, is not readily available. It is, for example, not very clear why students select one institution over another. This identifies a weakness in the information available to HE institutions.

Porter's model differentiates between the primary activities of the organisation that add direct value to the product or service to the customer, and the activities in support of the primary activities within the organisation.

The most important stakeholders of an HE institution can be identified as council members, managers, employees, students, customers, suppliers, competitors, donors and society at large (South Africa, 2003b, p.30).

PRIMARY ACTIVITIES (Activities that contribute directly to the value to the customer.) Primary activities are classified as inbound logistics, operations, outbound logistics, marketing and sales and service. Each of these process groups is briefly discussed below.

Inbound Logistics

The HE institution must obtain the "raw materials", the right quantity and quality of student from secondary schools. Individuals who have the highest potential for success must be selected. These individuals will have the highest value to the customer – in this case industry or business, and to the institution because government subsidies are higher for successful students.

If the student is regarded as the customer, the registration process can be regarded as the order entry system, and the objective would be to make this process as easy as possible, giving the student the information that the person needs to make the correct choice of product (the course or subjects from the student perspective). Career guidance teachers at secondary schools could be regarded as potential partners in this process, and these may be provided with online information and tools to assist in the process of career choice and hence, selection of study opportunities. Several South African HE institutions now make use of online application and online registration

systems.

In order to provide good quality education to students, HE institutions must have good educators with access to high quality information and the latest research results and industry trends. This implies good library systems and online information services. Educators need to be well networked with peers, other researchers, and individuals in their industry. This need is one factor that makes messaging systems, including email, direct messaging systems, newsgroups and other collaborative tools valuable in an HE environment.

The DoE policy documents call for HE institutions to ensure that "sufficient liaison mechanisms should be maintained with industry (preferably throughout the country) and, where applicable, with the vocational councils/bodies for every programme." This is to meet the objective that "instructional programmes must be aimed at meeting the needs of the vocation/industry concerned." (DoE Report 150, 1997, p.9). The opportunity to use technology to facilitate this process is very good. For example, electronic discussion groups can be used to obtain input from the industry leaders and managers.

Goodwill, a good reputation and a high regard for the HE institution are factors that influence donors and sponsors. These supporters of HE institutions may be in political positions or in industry. Goodwill can be created by e.g. keeping these stakeholders up to date with the institution's achievements, prestige magazines and annual reports. Many of these products can be delivered in electronic format at very little cost per additional unit to the institutions. Many individuals, including alumni, who might currently be industry decision makers, attach value to having a relationship with a prestigious HE institution.

Operations

Some of the key value adding processes include lecturing, assessment/examination and certification. The quality of lecturing material, including multimedia presentation, colour notes (possibly web based), with support in the person's home language is valued by the student. The ability to study when, where and how (i.e. at the student's own pace), is highly valued by the student. Assignments that can be submitted in electronic format relieves the student from the burden and cost of

having to print it, and gives the student the option to use colour, animations and other rich content in their assignments.

After having undertaken an assessment, prompt feedback is important to the student. Online assessment or semi-automated assessment support tools can facilitate this process.

Educators and their tools constitute the means of manufacture in the education process. The processes involved at this stage include course development and education delivery, assessment and research. The whole concept of re-useable modules holds much promise in the educational environment. Industry specifications and emerging standards for the description, packaging and runtime execution of learning resources include:

- Instructional Management Systems Project (IMS).
- Learning Resource Meta-Data Specification.
- IMS Content Packaging Specification.
- Advanced Distribution Learning (ADL) Shareable Content Object Reference Model (SCORM).

Microsoft's Learning Resource iNterchange (LRN), is an implementation of the above mentioned specifications (Microsoft Corporation, 2001, p.1).

Outbound Logistics

In a manufacturing environment this would refer to the processes involved in getting the product to the customer. If the customer is regarded to be the sponsor (parent, bursar or sponsor), then that party will be interested in progress of the student, and mechanisms must be put in place to streamline that process. Would it not be of value to parents to be able to view the outcome of assessments of their children's progress online? This is similar to an order-tracking facility.

If the student is the product, then the question revolves around how technology can be used to get the student in the industry – i.e. to supply the industry with the right person to do the job, and to get a job for every student, obviously of great value to

both the student and the industry. A consulting service, similar to that offered by employment agencies may be necessary. At some HE institutions, students are assisted with preparing CVs and online advice on interviews is available. Some institutions provide students with a web homepage, where they can post their CV and portfolio of successful assignments and projects (Personal communication, Mr S. Meyer, Webmaster at Port Elizabeth Technikon, 2004).

The certification process can be regarded as part of outbound logistics. Any employer should easily be able to verify the authenticity of an HE institution's certificate. At present this is quite a laborious process. An online verification facility could provide this valuable service.

Marketing and Sales

Marketing in the context of HE would imply marketing of the courses, the research and other capabilities, the students and the institution (brand).

Good quality and readily available online information on career choices and related courses is of great value to scholars in secondary school.

An institution's web pages are now often the window to the world. Educational institutions (like churches, governments, banks and other institutions, which are largely trust-based) have often resorted to using large impressive, stone or marble buildings built in ancient styles to create the impression of stability and trust. The emphasis today has shifted from the tangible buildings to the virtual entrance to the institution. Poor quality web pages can have a very significant effect on a modern educational institution, and should receive due consideration.

Email marketing has surpassed telemarketing and has become a very important marketing tool in most industries. Most scholars in secondary education now have email addresses, and government has major projects under way to provide Internet connections in all schools. Skillfully used, this is one of the most efficient and effective tools for marketing.

Service

It is likely that the student will return to the institution that he/she has a relationship

with for additional short courses or further education. Part of the after-sales service by the institution could be notifying the former student of additional relevant courses. This relationship can be facilitated by means of electronic communications and software that supports the customer relationship.

During their studies students value the services that many HE institutions offer e.g., student account information, marks and personal information on the student's personalized web portal. Access to web for information/research/lecturing purposes and library services on the campus adds value. In addition, customers expect to be able to pay for services or products online.

All humans value friendly and courteous treatment, and to be treated with dignity. An online mechanism where personnel can get feedback on how their service is perceived or valued by the clients may be of value to the institution and its clients. The number of complaints received is also often used as a key indicator of the quality of service delivery.

SUPPORT ACTIVITIES

Support activities contribute indirectly to the value created by the product or service provided to the client. These include human resource management, and procurement.

Human Resource Management (HRM)

The human resource, the carrier of the institution's intellectual and production capacity, is the most important resource of an HE institution. Attention could be given to human resource management support software. Can IT be harnessed to support the important processes such as finding and selecting suitable employees? The websites of some institutions are used to advertise vacant posts. When an employee leaves, much of the "intellectual capital" associated with that individual is normally lost to the institution. Knowledge management systems attempt to manage the information that the individual captured in the form of information products – documents, presentations, models lecture notes and the like. Knowledge creation and management are two of the key processes of an educational institution. Knowledge management is the discipline that treats intellectual capital as a

management asset. (Honeycutt, 2000, p. xvii).

Procurement

Procurement of goods and services plays a smaller role in an HE institution than in, for example, a manufacturing environment where materials form a large part of the total cost of the product. Still, checks, monitoring and quality assurance are important and procurement costs can be reduced with the assistance of ICT.

Conclusion

Porter's value chain model can be a valuable model to analyse applications and potential applications in HE institutions. It can assist by leading the user to think in terms of how value is added by applications, and if an application does not add sufficient value, it should be discarded. The tool serves as a useful framework to highlight the relationship between the different activities and applications.

IT plays a significant role in all the value-creating areas in an HE institution, and good governance of the IT function can be regarded as very important to the institution as a whole.

Appendix B.

Summary of ITS Modules and Functions as an example of ERP software used in HE in South Africa.

B.1. Introduction.

The following information is gleaned from the ITS website (http:/www.its.co.za) cited on 26 October 2004. Each subsystem is briefly described with the information from the website to give an indication of the application area. An attempt is then made to establish the value of, and the risk associated with the application in the institution.

B.2. The ITS Systems.

The integrated system consists of a number of sub-systems, some of which can stand alone and can be used in isolation, and others that are dependant on one or more of the other sub-systems to really be of value. The systems are grouped into 15 groups of applications, and are discussed as below.

B.2.1. Student Management systems

The applications classified as ITS student management systems deals with the management of qualifications, enquiries, admissions, registration, accommodation, student records, examinations and timetable. The student management systems also include subsystems such as Student Debtors, Distance Education, Alumni, Research Administration, Co-operative Education, Debt Collection Interface, Bursary and Loan Administration, Clinic Management and the Clubs & Societies system. Each of these are briefly described below.

B.2.1.1. Student Administration.

This system is the core of the Student Management System. It contains the following subsystems:

(i) The Academic Structure, in which qualifications/programmes and subjects/courses/modules are defined and linked in a curriculum. All pre-

and co-requisites are defined as well as mode of study (e.g. full time, distance) and length of each offering.

(ii) Student Enquiries, where information pertaining to prospective students are recorded. The system is used to record contact with the student from the first enquiry to the point where the student is registered. A record of all promotional material issued can be kept.

(iii) The Application and Admission subsystem can be used for the capturing of details pertaining to the student's application for study, including application for accommodation.

(iv) The Registration subsystem allows for the registration of students. Fees are automatically raised during registration. Full student biographical data is kept and photographs of students can be stored directly in the database.

(v) All academic study related detail is recorded in the Study Record subsystem. This includes test and assignment marks as well as examination marks. The system can print qualification certificates and degrees.

(vi) Timetables can be optimised in terms of space utilization, with consideration given to possible schedule clashes of student groups, and lecturers. An examination timetable can be generated.

The systems have certain customer relationship features, maintaining student information from the first enquiry through to application, selection, admission and registration and eventually of qualifications attained. It is clear that these systems contain sensitive personal information. It could, for example, have serious legal and reputation consequences for the institution if unauthorized changes were to be made to assessment data, or to the historic records of qualifications.

B.2.1.2. Student Debtor System

The Student Debtor system allows for the raising of fee debits based upon fee structures for tuition as well as accommodation fees. The system makes provision

for different accounts e.g. tuition, residence, meal, etc. and different payment agreements can be linked to each.

B.2.1.3. Distance Education System

The distance education system provides on-line input and query facilities on enquiry, registration, and academic- and other records, study guides, student fees, bursaries and loans, assignment/test and examination marks, examination attendance, results and grades, graduation and alumni.

B.2.1.4. Alumni System.

The Alumni system entails the record keeping of the whereabouts of alumni, their interests and achievements, as well as their involvement with their alma mater.

B.2.1.5. Research Administration

This system caters for the administration of research projects undertaken by students and staff as well as the functions associated with the attendance of conferences. The system assists with keeping records of projects, project members, research funding, progress reports, and research outputs.

B.2.1.6. Co-operative Education System.

The co-operative education system facilitates the recording of outside organisations partaking in co-operative education and the placing of students at these organisations. The system records information regarding the employer, the students placed at the outside organization, projects and evaluations of the students.

B.2.1.7. Bursary and Loan Administration.

The Bursary and Loan system handles all the requirements to administer bursaries and loans granted to students, on behalf of sponsors or the institution. This system may include sensitive information such as income, used as criteria for allocating bursaries or loans.

B.2.1.8. Clinic System.

The Clinic System facilitates the management of multiple institutional Health Clinics and is fully integrated with the existing ITS systems. The system assists with the scheduling of appointments, keeping of records such as diagnosis and treatment, billing of patients at different tariffs as well as the submission of accounts to Medical Aid Societies.

B.2.1.9. Clubs and Societies.

This system allows for the linking of students to clubs and societies, defining their membership roles, recording results and generating transactions such as membership fees.

B.2.2. Financial Management Systems.

HE institutions have complex financial systems. The ITS financial systems were designed to increase the efficiency of financial operations. These systems enable a large number of users to perform on-line, real-time, distributed financial transactions. The systems include: General Ledger, Accounts Receivable, Procurement Management (including Purchase Orders, Accounts Payable and Stores system), Long Term Loans, Cash Management (including Counter Payments and Receipts, Cash Book, Electronic Banking, ACB facility and Mail Recording), Income and Expenditure Budgeting, ACB Payments and Receipts and Investment Register.

Some of the value added features of the ITS computerized systems include: (i) Flexible account structure with multiple hierarchies; (ii) hierarchical account amalgamation, important for faculties and departments; (iii) budget control with user override facilities; (iv) VAT calculations, reporting and apportionment, features important in a South African context; (v) automated supplier payment with manual override; (vi) maximization of supplier discounts; (vii) fixed asset accounting; (viii) comprehensive management reporting; (ix) faculty and departmental segmentation; (x) administration of the institution's investment portfolio; (xi) integrated, multi-store and multi-location stock control.

B.2.3. Human Resources Systems

The ITS Personnel and Payroll systems are fully integrated with one another. Most of the data required by the Payroll system is defined in the Personnel system. The

Salary Budgeting system is used as a planning tool during the budget cycle. It can however also be used during the year to estimate the final salary expenditure on a month to month basis.

B.2.3.1. Personnel System.

This system handles all activities concerned with personnel, recruitment, position control, disciplinary actions and leave administration.

Features required by HE institutions include:

- Organizational structures including position management.
- Recruitment facilities: advertising costs, applications and application statistics.
- Skills, qualifications, dependants and membership details.
- Equity Act reporting.
- Activity based time-sheet facilities with automatic interfaces with resources such as space, assets and finance.
- Disciplinary action recordings.
- Leave entitlement administration.

B.2.3.2. Payroll System.

This package handles the salary-related detail and processing of remuneration of staff and contract workers. Features that are important in a South African HE environment include the calculation of Skills Levy and associated reports as well as the maintenance of statutory tax tables and associated reports.

The value of these systems to an HE institution is obvious. Unauthorised changes to payroll information, or mistakes and faults in these systems can result in loss of money and reputation, and can result in low staff morale. Likewise, loss of privacy can have serious implications.

B.2.4. Web Access Systems

The Web Access Systems allow students, lecturers, other staff and the general public access to predefined areas in the system for viewing and selected update of data through the Internet or Intranet of the client institution. Current systems include the Student Web, Lecturer Web and the Personnel Web. Finance and Executive Web Systems will follow.

B.2.4.1. Student Web System

The student web system has been developed to allow prospective and current students to obtain institutional, programme and personal information via either the Internet or the intranet of an institution. Students may register online or apply online for residence. Lecturing staff are able to view student data via the Internet or intranet, and it is possible to enter class test and examination marks directly into the system via the Internet.

B.2.4.2. Personnel Web System.

The Personnel Web System adds value to staff and reduces the administrative load on the institution by its self-help features. Staff can apply for leave online. Approval of leave is handled via a workflow system using predefined user specified rules. Staff can make changes to their own biographical details.

B.2.4.3. Lecturing Web System

This system allows lecturers to view and update selected student academic data via the Internet. It further provides access to lecturing time tables. Lecturers can view student photographs, print class lists and enter test and examination results.

B.2.5. Facilities management Systems.

Included in this group of systems are the Estate and Space Management System and the Asset Management System.

B.2.5.1. Estate and Space Management System.

This package caters for the definition of all the institution's space requirements and statutory reporting regarding the utilization of facilities. The system supports

inventory, management and control of all types of assets like land, land improvement, buildings and car parking management facilities.

B.2.5.2. Asset management

This package caters for the control of all the institution's assets. The system supports inventory, management and control of all types of assets, stock taking, maintenance and the costs associated with maintenance and the valuation and depreciation of assets.

B.2.6. Costing Systems

This group of systems consists of the Job Costing System and the Print Costing System. The job costing system supports the definition of jobs, defines and controls the cost associated with specific jobs, and assists to ensure that jobs are completed on time. The print costing system is similarly used, but has features specific to a printing shop environment. Printing of lecturing materials as well as tests and exam papers on time, on budget and securely in an HE environment is a challenge, and these computerized systems are of great value to the institution.

B.2.7. Committee System.

The Committee System allows for the creation of committees and the record keeping of their agendas and minutes. The system keeps record of the appointment of members, the definition of roles within committees and restrictions that apply to access to the minutes or agendas of different meetings. Committees play a very important role in the management of public HE institutions, and the records of decisions are important resources to the institutions.

B.2.8. Contact Management System.

This module facilitates the administration of contacting organisations and people outside the institution. It is used to record details of the individuals or organizations, pledges and contributions, and interaction and follow-up requirements.

B.2.9. Quality Measurement System.

The Quality Measurement System allows users to capture information from questionnaires, to extract responses and to do statistical analysis of responses.

B.2.10. Card Systems.

The card systems allow for the use of any card technology (e.g. bar code, magnetic strip, proximity) in the Meal System, Access Control System, Student Kiosk Enquiry System and the Parking Control System.

B.2.10.1. Meal Booking and Point of Sale System.

The meal subsystem has been designed to permit users to obtain food items or other services of which the cost is charged to a card account. The system supports a point of sale approach, as well as a meal booking service. The system can be used in, for example, a cafeteria or a bookstore, where the user collects the different items, and the person's account is debited with the amount at the cashier. The prices of items can be obtained by reading the bar codes. A sales slip can be produced. The meal booking system enables the caterers to prepare just the right amount and type of food, cutting down on waste, lowering prices, and ensuring that the clients get what they actually wanted.

B.2.10.2. Access Control System.

This system provides for the control of students or personnel members to certain areas of campus, a particular building or a specific venue based on pre-defined criteria. The system facilitates, for example, registered residence student access to their applicable residence or students registered for a specific subject access to a specific laboratory for that period.

B.2.11. Student Kiosk Enquiry System.

The Kiosk System enables a student to view and print information from the Student Administration System, for example, registration, examination, timetable, student debtor, bursary and loan information. This self-help system is of value to students that can potentially use the system via the Internet at any time from anywhere, and it

takes an administrative load away from the administrative staff. Systems open to the Internet are also exposed to a greater security risks.

B.2.12. Parking Control.

The system can be used to allocate parking discs to students, personnel and outside contractors.

B.2.13. Booking systems.

This system facilitates the booking of venues, vehicles and media such as cameras, projectors and other equipment. The system makes provision for different charge-out rates, allowing the institution to track the utilization of resources by the different units.

B.2.14. ITS Library System.

The library system contains the facilities necessary for the day to day running of a modern library. The system is integrated with all the other ITS systems, obviating the need to re-register students and staff members as users, whilst all financial limitations as set out in the Procurement Management system such as budget constraints, are adhered to. The system supports cataloging of items, circulation of items, inter-library loans, periodical control, and can be used to produce management and statutory reports.

B.2.15. Management information Systems.

B.2.15.1. Departmental Statistical Reports.

This system can be used to produce statistical reports required by the Department of Education for subsidy and other purposes. These statutory reports are subject to strict auditing and unauthorised or inaccurate information can lead to fines and loss of the institution’s good reputation.

B.2.15.2. Management Reports.

Detailed reporting on academic teaching activities such as teaching loads, pass ratios and class sizes is of great value to managers that are concerned with the efficiency and effectiveness of the institution’s functions.

B.2.15.3. Management information Views and Summary Tables.

The ITS Management Information Views and Summary Tables system allows managers with flexible access to information on the different functional areas in the organisation. It allows managers to view summarised information, and then "drill-down" into specific areas for more detailed information.

B.2.15.4. Three Year Rolling Plan System.

This subsystem can assist an institution to project future student enrolments based on past and current student enrolment figures. The user has the option to calculate a projection based on student figures or to enter projected figures manually. This type of tool is valuable to the institution for planning, and for reporting to the Department of Education (DoE).

B.2.15.5. Technical Systems.

The technical systems are used to assist the database administrator to maintain data definitions and to perform database housekeeping. It also incorporates a tool that can be used to generate programs that can be used to extract information from the database.

B.3. Conclusion.

The widely used ITS system demonstrates the value and importance of computerized administrative systems in HE in South Africa. These systems may be grouped in Ward and Peppard's "key operational" applications (Ward & Peppard, 2002, p.42). Major updates to these systems are required from time to time, due to advances in technology, and the pressure from the user groups for additional features to enhance productivity, and to meet the requirements of stakeholders such as students, staff and the DoE. This may require significant cost and effort in the areas of hardware, software modifications, networks and training. Upgrades are also associated with a measure of risk, with possible down time, and changes to business processes. As can be deducted from the descriptions above, changes to these systems can impact on the entire organisation, and co-ordination and agreement between departments are imperatives. It is thus appropriate that such projects should be directed by a

governance structure such as a project steering committee with representation from executives from the major departments.

According to Richard Katz, Vice president of EDUCAUSE, more than half of US and Canadian colleges and universities installed commercially vended financial, human resource or student information systems. He sees the "next big thing" as integration. He predicts that this decade will witness the evolution of a new IT architecture for HE institutions. The architecture will facilitate integration through the adoption of standards such as XML, SOAP, UDDI and others. The new architecture depends more on confederating the data inside of systems than integrating the systems themselves (Katz, 2003, p.1-2). It is relatively easy to interface the ITS system with other web services to extend the functionality in the areas where weaknesses exist. It is therefore likely that integrated systems, such as ITS will play an even greater role as key operational systems in HE institutions.

Appendix C.

IT Governance Survey of Public Higher Education Institutions

Please answer the four questions below, which will be used in a research project titled: "Applying a framework for IT Governance in South African Higher Education Institutions"

Information regarding individual respondents and institutions will be kept confidential, and summarized information will be provided to you.

Please return to: Stephen Viljoen, P/Bag X6011, Port Elizabeth, 6000 or steve@petech.ac.za.

Any queries please contact Stephen Viljoen at 0825761677.

Thank you very much for your participation in this survey.

Question

1. Institution Name: _____

2. At the above mentioned institution IT Governance or security standards have been adopted to the following extent:

Standard	Not at all implemented	Planned for next 12 Months	Partially implemented	Fully implemented
CobiT				
ITIL				
BS15000				
BS7799				
MOF				
Other:				
Other:				

3. Considering the attached IT Governance maturity model, I rate IT Governance at the above mentioned institution at maturity level (0-5) : _____

4. Using the same IT Governance maturity model, I rate the maturity of IT Governance of the Higher Education Industry in South Africa at level (0-5) : ____

The following description of the IT governance model is taken verbatim from CobiT (IT Governance Institute, 2000d, p.63-64).

IT Governance Maturity Model.

Governance over information technology and its processes with the business goal of adding value, while balancing risk versus return.

0 Non-existent. There is a complete lack of any recognisable IT governance process. The organisation has not even recognised that there is an issue to be addressed and hence there is no communication about the issue.

1 Initial /Ad Hoc. There is evidence that the organisation has recognised that IT governance issues exist and need to be addressed. There are, however, no standardized processes, but instead there are ad hoc approaches applied on an individual or case-by-case basis. Management's approach is chaotic and there is only sporadic, nonconsistent communication on issues and approaches to address them. There may be some acknowledgement of capturing the value of IT in outcome-oriented performance of related enterprise processes. There is no standard assessment process. IT monitoring is only implemented reactively to an incident that has caused some loss or embarrassment to the organisation.

2 Repeatable but Intuitive. There is global awareness of IT governance issues. IT governance activities and performance indicators are under development, which include IT planning, delivery and monitoring processes. As part of this effort, IT governance activities are formally established into the organisation's change management process, with active senior management involvement and oversight. Selected IT processes are identified for improving and/or controlling core enterprise processes and are effectively planned and monitored as investments, and are derived within the context of a defined IT architectural framework. Management has identified basic IT governance measurements and assessment methods and

techniques, however, the process has not been adopted across the organisation. There is no formal training and communication on governance standards and responsibilities are left to the individual. Individuals drive the governance processes within various IT projects and processes. Limited governance tools are chosen and implemented for gathering governance metrics, but may not be used to their full capacity due to a lack of expertise in their functionality.

3 Defined Process. The need to act with respect to IT governance is understood and accepted. A baseline set of IT governance indicators is developed, where linkages between outcome measures and performance drivers are defined, documented and integrated into strategic and operational planning and monitoring processes. Procedures have been standardised, documented and implemented. Management has communicated standardised procedures and informal training is established. Performance indicators over all IT governance activities are being recorded and tracked, leading to enterprise-wide improvements. Although measurable, procedures are not sophisticated, but are the formalisation of existing practices. Tools are standardised, using currently available techniques. IT Balanced Business Scorecard ideas are being adopted by the organization. It is, however, left to the individual to get training, to follow the standards and to apply them. Root cause analysis is only occasionally applied. Most processes are monitored against some (baseline) metrics, but any deviation, while mostly being acted upon by individual initiative, would unlikely be detected by management. Nevertheless, overall accountability of key process performance is clear and management is rewarded based on key performance measures.

4 Managed and Measurable. There is full understanding of IT governance issues at all levels, supported by formal training. There is a clear understanding of who the customer is and responsibilities are defined and monitored through service level agreements. Responsibilities are clear and process ownership is established. IT processes are aligned with the business and with the IT strategy. Improvement in IT processes is based primarily upon a quantitative understanding and it is possible to monitor and measure compliance with procedures and process metrics. All process stakeholders are aware of risks, the importance of IT and the opportunities it can offer. Management has defined tolerances under which processes must operate. Action is taken in many, but not all cases where processes appear not to be working effectively or efficiently. Processes are occasionally improved and best internal

practices are enforced. Root cause analysis is being standardised. Continuous improvement is beginning to be addressed. There is limited, primarily tactical, use of technology, based on mature techniques and enforced standard tools. There is involvement of all required internal domain experts. IT governance evolves into an enterprise-wide process. IT governance activities are becoming integrated with the enterprise governance process.

5 Optimised. There is advanced and forward-looking understanding of IT governance issues and solutions. Training and communication is supported by leading edge concepts and techniques. Processes have been refined to a level of external best practice, based on results of continuous improvement and maturity modeling with other organisations. The implementation of these policies has led to an organisation, people and processes that are quick to adapt and fully support IT governance requirements. All problems and deviations are root cause analysed and efficient action is expediently identified and initiated. IT is used in an extensive, integrated and optimised manner to automate the workflow and provide tools to improve quality and effectiveness. The risks and returns of the IT processes are defined, balanced and communicated across the enterprise. External experts are leveraged and benchmarks are used for guidance. Monitoring, self assessment and communication about governance expectations are pervasive within the organisation and there is optimal use of technology to support measurement, analysis, communication and training. Enterprise governance and IT governance are strategically linked, leveraging technology and human and financial resources to increase the competitive advantage of the enterprise.