

**An information technology governance framework
for the public sector**

by

Judith Terblanche

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Supervisors: Dr WH Boshoff

Prof R Butler

Faculty of Economic and Management Sciences

Department of Accounting

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DECLARATION

I, the undersigned, hereby declare that the work contained in this assignment is my own original work and that I have not previously in its entirety or in part submitted it at any university for a degree.

Judith Terblanche

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ABSTRACT

Information technology (IT) has an impact on the accomplishments of the entity (Kaselowski, 2008:83). Traditionally, public sector entities struggle to gain any value from the IT environment and regularly overspend on IT projects.

In South Africa the Third King Report on Corporate Governance (King III) introduced 'The governance of IT' (IODSA, 2009) applicable to both private and public sector entities.

Although generic IT frameworks such as ITIL and COBIT exist and are used by private and public entities to govern the IT environment, public sector entities require a specific IT governance framework suited to the unique characteristics and business processes of the public sector entity. Taking into account the unique nature of the public sector entity, the purpose of this study was to assist public sector entities in their IT governance efforts through the development of a framework to be used to govern IT effectively, since sufficient guidance for the public sector does not exist.

Leopoldi (2005) specifically pointed out that a top-bottom framework could be limiting for entities operating in a diverse field and having complicated organisational structures, both characteristics integral to the public sector environment. Since a top-bottom and a bottom-top approach fulfil different purposes, both are needed for IT governance in the public sector entity.

By combining the two approaches and focusing on the unique environment of the public sector entity, a governance framework can be established. This will ensure that insight has been gained into the IT environment and the business processes and that true alignment between the business and the IT environment for the public sector entity has been achieved.

This framework developed will assist the public sector entity in governing the IT environment unique to this industry and will equip public sector management with a framework to govern IT more effectively, while under pressure of public scrutiny.

OPSOMMING

Informasietegnologie (IT) het 'n impak op die prestasies van 'n entiteit (Kaselowski, 2008:83). Openbare sektor entiteite sukkel tradisioneel om enige voordeel uit die IT-omgewing te behaal en oorspandeer gereeld op IT-projekte.

Die Derde King Verslag oor Korporatiewe Beheer (King III) het beheerbeginsels vir IT omskryf wat vir beide die private en openbare sektor entiteite in die Suid-Afrikaanse konteks toepaslik is (IODSA, 2009).

Alhoewel generiese IT raamwerke, soos ITIL en COBIT, deur beide private en openbare sektor entiteite gebruik word om die IT-omgewing te beheer, benodig openbare sektor entiteite 'n toepaslike IT-beheerraamwerk wat die unieke eienskappe en besigheidsprosesse van die openbare sektor entiteit ondersteun. Die fokus van hierdie navorsing was gerig op die identifisering van 'n IT-beheerraamwerk vir die openbare sektor, om openbare sektor entiteite te ondersteun in die beheer van IT. Aangesien die aard van 'n openbare sektor entiteit verskil van dié van 'n private sektor entiteit, moet die beheer wat toegepas word ook verskillend van aard wees en geen toepaslike riglyne vir die openbare sektor is tans beskikbaar nie.

Entiteite wat in 'n diverse omgewing bedryf word en aan 'n komplekse organisatoriese struktuur blootgestel is, mag moontlik deur gebruik te maak van 'n top-bodem beheerraamwerk beperk word (Leopoldi, 2005). Beide hierdie eienskappe is integraal tot openbare sektor entiteite. 'n Top-bodem en 'n bodem-top beheerraamwerk vervul verskillende funksies en in die openbare sektor is beide aanslae noodsaaklik vir die beheer van IT.

Deur gebruik te maak van 'n gekombineerde aanslag en op die unieke eienskappe verwant aan die openbare sektor entiteite te fokus, kan 'n effektiewe beheerraamwerk ontwikkel word. Dit sal verseker dat insig in die IT-omgewing en die besigheidsprosesse verkry is en dat belyning tussen die besigheid en die IT-omgewing vir die openbare sektor bereik is.

Die beheerraamwerk wat ontwikkel is sal die openbare sektor entiteit ondersteun om die IT-omgewing, uniek aan die sektor, doeltreffend te beheer. Die openbare sektor is blootgestel aan skrutinerings en bestuur sal nou toegerus wees met 'n beheerraamwerk om die IT-omgewing meer effektief te bestuur.

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CHAPTER 1

INTRODUCTION

1.1 Background

Posthumus, Von Solms and King (2010:23) argue that companies are not able to stay competitive without information technology (IT). IT is an indispensable element for success in the contemporary business world. All business entities need IT in order to achieve the required outcomes for their stakeholders and customers. However, the IT environment is changing rapidly and companies need to find the balance between keeping IT costs down while remaining up to date (Calder, 2010). At the same time IT should at the least be reliable and improve the effectiveness of the entity (Subang, 2007).

IT is not just crucial to a corporate business, but has become integral to public sector entities as well, in order to deliver the required outcomes for the specific stakeholders. The mere fact that IT has become a vital element in the functioning of the public sector heightens the importance of proper governing of the IT environment and processes of the public sector entity (Nfuka & Rusu, 2010b; Woods, 2010).

The sentiment regarding IT has changed: it is no longer seen as something that is not part of the core business – a mere add-on. Business leaders now acknowledge that since IT is central to the business, IT governance should be central to corporate governance (Badenhorst, 2009) and the same focus should be put on managing and governing IT as on business ideas and processes. Management should ensure that IT forms part of the strategic vision of the company. The challenge for companies remains in the fact that management often lack knowledge and insight into the IT processes and architecture (Posthumus *et al.*, 2010:23). Badenhorst (2009) found that there is a lack of ownership for IT because boards often lack the technical insight required to understand IT and the related risks.

In 2008 the Information Systems Audit and Control Association (ISACA) carried out a survey on business and IT issues experienced by IT executives. The results

identified that 'regulatory compliance' and 'IT governance' are perceived to be the most significant business issues from an IT perspective. It is evident that regulatory compliance will be at risk if effective IT governance is not intact. According to the respondents it is not possible to provide business with reliable and effective services if the governance principles are not solid (ISACA, 2008).

The IT Governance Institute (ITGI) was founded in America in 1998 to assist global entities in establishing sound IT governance. The ITGI defines IT governance as "the leadership, organisational structures and processes that ensure that the enterprise's IT sustains and extends the enterprise's strategies and objectives" (ITGI, 2003).

In South Africa the Third King Report on Corporate Governance (King III) highlighted a new category of corporate governance in the South African context, namely 'The governance of information technology (IT)' (IODSA, 2009). King III, which became operational in South Africa on 1 March 2010, is the first corporate governance report that is applicable to all South African entities, thus including public sector entities.

Nfuka and Rusu (2010b) identified a lack of research into the maturity of IT governance for public sector entities and found that developing countries are lacking behind in IT governance when compared to developed countries. For this reason the public sector environment is not yet reaping the advantages of modern-day technology in managing a business. Consequently wrong IT projects are chosen and then aborted because there are no benefits. Another challenging issue is overspending on IT projects due to lack of insight into the IT and business aspects of the entity. For example, the public sector in the United Kingdom is paying 40% above the market rate for IT outsourced services, whilst these funds should have benefited society directly (Woods, 2010).

Since IT has an impact on the accomplishments of the entity it is imperative that all entities, including any public sector entity, have a sound IT governance framework to assist in the process of IT governance (Kaselowski, 2008:83). Several generic IT frameworks exist, such as the Information Technology Infrastructure Library (ITIL) for service delivery and the Control Objectives for IT (COBIT) framework for best practice. At this stage both private sector and public sector entities are using ITIL

and COBIT as frameworks to govern IT within their organisations (Nfuka & Rusu, 2010b).

However, public sector entities differ from private sector entities (Gartner, 2010) as they are enablers of society and consist of unique business processes which are not applicable to the private sector; use taxpayers' funds to provide a service to the wide public (Williams, 2009); and cover several different areas of service delivery, such as social care and transportation.

Since the business processes of public and private sector entities are different, the question arises whether the IT frameworks that are currently in use address the particular governance requirements for the IT environment within a public sector entity.

1.2 Research objective and value of study

Although generic IT frameworks such as ITIL and COBIT exist and are used by private and public entities to govern the IT environment, public sector entities require a specific IT governance framework suited to the unique business processes of the public sector entity. The primary objective of this research project was to develop an IT governance framework suitable for the public sector. It is believed that this framework will assist the public sector entity in governing the IT environment unique to this industry and that it will equip public sector management with a framework to govern IT more effectively, while under pressure of public scrutiny.

1.3 Research design and methodology

This research was a non-empirical study. As part of the study existing literature on aspects relating to the development of an IT governance framework for the public sector, was read and reviewed. Based on the literature review, a process was followed to develop an effective framework to govern IT in the public sector. The research is reported in this assignment as follows:

In Chapter 2 IT governance and governance-related concepts are defined. Chapter 2 contains information relating to the issuing of the King III report that introduced the concept of IT governance as part of corporate governance principles for South African entities. For purposes of this research, the focus was on the introduction of IT governance for the public sector, with specific reference to principle 5.2 and principle 5.3 of the King III report. Principle 5.2 and 5.3 of the King III report read as follows (IODSA, 2009):

- *Principle 5.2:* 'IT should be aligned with the performance and sustainability objectives of the company'.
- *Principle 5.3:* 'The board should delegate to management the responsibility for the implementation of an IT governance framework'.

In Chapter 2 the investigation into reasons for the problems with achieving IT governance and alignment are reported.

In Chapter 3 the contextual differences between the public and the private sector are highlighted by examining the key findings of both international and South African research. Chapter 3 addresses principle 5.2 of the King III report by identifying the unique characteristics of the public sector entities. The focus is on understanding how the characteristics of a sector determine the requirements for the IT environment.

Based on the unique characteristics of the public sector environment identified in Chapter 3, an analysis of the business processes and business imperatives of a public sector entity is provided in Chapter 4. The IT environment is also analysed to gain insight into what it entails.

Chapter 5 brings to a close principle 5.2 of the King III report, by aligning the business imperatives of a public sector entity with the IT environment. The process started in Chapter 3 (unique nature of public sector entity), continued in Chapter 4 (impact of unique nature on the IT environment) and was concluded in Chapter 5 (alignment).

Chapter 6 addresses principle 5.3 of the King III report by recommending an IT governance framework for the public sector. The need for a framework is discussed and the generic IT governance frameworks currently in use are examined. Based on the weaknesses of using generic frameworks, recommendations are made for an IT governance framework that will be suitable for the public sector.

Chapter 7 concludes this research.

1.4 Limitations of the study

Although the purpose of the research was to develop an IT governance framework for the public sector, the assignment reflects the opinions of the author. This research aims at assisting public sector management in gaining insight into the unique IT environment of their entities and to assist in the process of aligning business processes and governing the IT environment. It is suggested that this research be broadened in future to test the framework developed, by conducting a survey on the perceptions of public sector management on the conclusion derived from this research.

CHAPTER 2

DEFINING GOVERNANCE CONCEPTS

2.1 Corporate governance

A country is only as healthy as the companies that operate in that country. This was the underlying perspective of the Report of the Committee on the Financial Aspects of Corporate Governance, better known as the Cadbury Report, which was issued in the United Kingdom in 1992 (Cadbury, 1992). The Cadbury Report was developed to strengthen social corporate responsibility by providing guidance to boards of directors in governing their companies. This led to the implementation of corporate governance principles for the United Kingdom (ITGI, 2003).

During the 1990s it was evident that investors were starting to consider the corporate governance status of a company when they executed investment decisions, creating an incentive for business leaders to improve on the corporate governance status of the company (Chung & Zhang, 2011:248). Corporate governance therefore, became important as a strategy and measurement tool for business leaders (Kaselowski, 2008:11).

Corporate governance is defined as an accountability tool between the management and the stakeholders of the company, to monitor and achieve the objectives of the company in an ethically sound manner (Fleming & McNamee, 2005:139). This means that management should be transparent and competent in order to fulfil their leadership role (IODSA, 2009).

However, there is a risk that companies might apply corporate governance principles merely for the sake of 'ticking the box'. In such instances, management will lack insight into the objectives and advantages of applying corporate governance principles, and this will result in little benefits for the stakeholders. It is therefore important that corporate governance should not be seen as the goal in itself, but

rather as the vehicle that transforms the business into tangible outcomes (Kaselowski, 2008:12).

Several collapses of international high-profile companies, such as Enron and WorldCom, in recent years, have led to the mandatory compliance of new regulatory corporate governance requirements (Gartner, 2009) in certain countries. This focus on corporate governance was mainly due to the need for accountability and the safeguarding of stakeholder interest (Kordel, 2004:40).

Companies are reliant on IT, at a minimum for engaging with clients and recording all business information and transactions (Badenhorst, 2009) and at a maximum, for sustainability and enhancement (De Haes & Van Grembergen, 2009:123). Due to the nature of IT, companies are exposed to risk and high costs. It appears to be an anomaly that board members did not focus on IT until recently (Badenhorst, 2009). The ITGI compiled the *Global Status Report on the Governance of IT (CGEIT) – 2011* and reported that 94% of the respondents recognised that IT is pivotal in the delivery of the overarching business plan of a company (ITGI, 2011). If IT assets are not utilised and managed in a way to support the business, it will ultimately hamper the company (Sethibe, Campbell & McDonald, 2007). This dependency of companies on IT has led to a need for the governing of IT (Kordel, 2004:40; De Haes & Van Grembergen, 2009:123). This implies that corporate governance is not governance if it does not include IT governance (Sethibe *et al.*, 2007). However, since IT is an enabler of any business, it is essential that the IT governance policy of an entity is not developed or adopted in isolation, but is interrelated with the strategy and vision of the business (Wilkin & Chenhall, 2010:135–136).

The issuing of governance principles for South African companies contained in the King III report has led to the introduction of IT governance in the South African context and to the inclusion of IT governance as part of the corporate governance principles that South African companies should apply (IODSA, 2009).

2.2 IT Governance in the King III report

The King III report was issued on 1 September 2009 and became effective in South Africa on 1 March 2010. The King III report aims to be internationally on the forefront regarding corporate governance principles. This report differentiated itself from prior King reports because of the introduction of IT governance, the applicability of the report to all entities and the corporate social responsibility imposed on entities (IODSA, 2009).

IT is integral to any entity and has become an imperative for all strategic decision-making. However, IT remains an area associated with great costs and it is important that businesses fully utilise this investment asset to sustain and grow the company. The IT environment is constantly evolving – creating new opportunities, but also carrying some risks. If IT systems are not functioning accurately or even when the systems are accessed without authorisation, it could lead to severe financial loss. For this reason, Chapter 5 of the King III report aims to create awareness about the importance, potential value and associated risks of the IT environment (IODSA, 2009).

The King III report defines IT governance as “the effective and efficient management of IT resources to facilitate the achievement of corporate objectives” (IODSA, 2009). Chapter 5 of the King III report contains seven IT governance principles that South African companies should adopt and elaborates on these principles by recommending how these principles should be applied in practice (IODSA, 2009).

Table 2.1 lists and explains the IT governance principles included in Chapter 5 of the King III report (IODSA, 2009).

Table 2.1: King III – IT governance principles

Chapter 5: Principles	Explanation
Principle 5.1	The board should be responsible for information technology (IT) governance.
Principle 5.2	IT should be aligned with the performance and sustainability objectives of the company.
Principle 5.3	The board should delegate to management the responsibility for the implementation of an IT governance framework.
Principle 5.4	The board should monitor and evaluate significant IT investments and expenditure.
Principle 5.5	IT should form an integral part of the company's risk assessment.
Principle 5.6	The board should ensure that information assets are managed effectively.
Principle 5.7	A risk committee and an audit committee should assist the board in carrying out its IT responsibilities.

Based on the IT governance principles in Table 2.1, it is therefore imperative that board members (principle 5.1) gain insight into the IT environment and include the IT environment as a strategic business element. They need to lead in aligning (principle 5.2) the business environment with the IT environment and should incorporate IT in all strategic planning and decision-making sessions. This will lead to reduced risks (principle 5.5) and create greater value for the company (principle 5.4 and 5.6).

In essence, the challenge for board members is to align the IT environment with the business environment. The only way to achieve this is by adopting a suitable framework to govern IT (principle 5.3). The challenge of principle 5.2 of the King III report is fundamentally not *that* IT should be aligned with the business objects of the entity, but rather *what* should all be considered as part of the IT environment when performing the alignment exercise. The IT governance framework adopted by the entity will only be effective if it includes and addresses all the different components of

the IT environment. It is therefore essential to gain insight into the IT environment and the business environment before developing and implementing an IT governance framework.

2.3 Implications of the King III report for the public sector

One of the fundamental principles of the King III report is the message of social responsibility that companies have for the people of the country – especially the community in which they operate (IODSA, 2009). This corresponds with the vision of the South African National Government to improve service delivery to all, as well as with the Batho Pele principles (PWC, 2009; PWC, 2010b), which were introduced in 1997 and set the scene for corporate governance principles on local authority level (DPSA, 1997).

The most important aspect of a public sector entity is the delivery of a specific service to the citizens in order to improve the quality of life for all (Woods, 2010). The particular service(s) need to be delivered in a sustainable way and public sector entities in South Africa are under pressure to advance in service provision. This is however only possible if public sector entities are able to utilise their IT assets in a modern and effective way, to reap the required benefits. The South African government acknowledges that IT is integral in reaching the community and delivering services in a more effective manner (PWC, 2010b) – thus IT functions as the enabling agent. By being more efficient, money could be saved and invested directly to the benefit of citizens. The South African national government incorporated the E-government programme as part of their Vision 2014 priorities (PWC, 2010b) – not in a traditional way as hardware and software, but as a vehicle to improve service delivery and creating access for all (ITGI, 2003; Le Roux, 2010:50; PWC, 2010b).

Local authorities are obliged to improve service delivery, be cost-effective and keep up to date with innovative technology trends. After IT was identified as a fundamental element of running a business and hence the introduction of IT governance in the King III report, it was emphasised that local authorities should prioritise IT as an

important strategic asset and include it when determining the road forward as well as in identifying risks (PWC, 2009).

Braxton (2011) highlights several recent failures of the South African national government with regard to IT projects and concludes that a possible reason for these failures could be the complexities that exist between local, provincial and national government and the applicable legislative requirements. On the same theme, Nfuka and Rusu (2010b) investigated the maturity status of IT governance in developing countries, with specific focus on Tanzania, and found that they are lacking behind when compared to developed countries. When Kaselowski (2008:3) investigated the existing best practices for IT governance in local authorities in South Africa, the conclusion was that the value of IT has not yet been discovered, even though the role of IT is addressed in government legislation such as the Municipal Finance Management Act and the Municipal Systems Act.

Within government organisations there is a struggle with regard to the utilisation and maintenance of IT assets – mainly due to the various non-integrated systems that are in use. Public sector entities invest in IT assets, but benefit little. The government has been criticised for the failure to deliver on IT and for consequently starting to outsource more services, which leads to higher costs and still little in-house knowledge. Great reliance is placed on certain individuals with expert knowledge, but as people move into new jobs, the entity is left with a void (Mochiko, 2010).

By implementing the IT governance principles contained in the King III report these issues can be addressed (Woods, 2010).

2.4 IT governance

Sound corporate governance frameworks offer the stakeholders of companies some assurance that the business is geared to achieve the objectives and that assets are safeguarded (Kaselowski, 2008:12, 17). The transition from the King II to the King III report indicates the heightened importance of IT (Le Roux, 2010:68). It includes IT as an essential factor for good corporate governance that should be understood by

board members from a strategic viewpoint (Campbell, McDonald & Sethibe, 2009:11).

Corporate governance is about board members being transparent and taking responsibility for their decisions regarding the investments made by stakeholders. IT governance is a focus point of corporate governance, based on the same fundamental principles. As with corporate governance, IT governance should be developed around the nature of the specific business and should therefore be part of an integrated process (Gartner, 2009).

This is supported by the definition of IT governance. Several definitions exist to define IT governance. Table 2.2 presents some of the more widely-used definitions for IT governance.

Table 2.2: IT governance definitions

Defined by	IT governance is:
ITGI (2003)	... the responsibility of the board of directors and executive management. It is an integral part of enterprise governance and consists of the leadership and organizational structures and processes that ensure that the organization's IT sustains and extends the organization's strategy and objectives.
Gartner (2006)	... the processes which ensure the effective and efficient use of IT in enabling an organisation to achieve its goals.
Wijsman, Neelissen and Wauters (2007:22)	... the joint responsibility of the executive management level of an organization and its supervisor(s) for (1) strategic planning and (2) internal control of the organization's deployment of IT and for (3) external accountability and (4) external supervision of the organization's deployment of IT.
Campbell <i>et al.</i> (2009:5)	... the structure of relationships, processes and mechanisms used to develop, direct and control IT strategy and resource allocation so as to achieve the goals and objectives of an enterprise. It is a set of formal processes aimed at balancing the risk and return aspects of IT investment so as to consistently add value to the organization.

From Table 2.2 above it is evident that the IT governance principles contained in the King III report (Table 2.1) incorporate all the aspects of widely-used definitions of IT governance. For board members to take responsibility for the IT environment they need to understand and manage the associated risks and thereby maximise the potential benefits of the investment in IT assets (Tansley, 2007:12). IT governance in its most basic sense is achieved when:

- board members gain insight into and understand the IT environment of the company;
in order to
- align the IT environment towards the specific objectives of the particular company (principle 5.2 of the King III report);
by
- adopting a framework to govern IT (principle 5.3 of the King III report).

(Chun, 2005; Sethibe *et al.*, 2007; Nfuka, 2008; De Haes & Van Grembergen, 2009:135)

2.5 Problems with IT governance and alignment

Aligning the IT environment with the objectives of the company in order to achieve IT governance is not easy. Senior management and board members are reluctant to take ownership for IT matters, even though great costs and risks are at large (Butler & Butler, 2010:34) for two reasons: (1) they are uncertain about what IT entails and lack insight into the technical components (ITGI, 2003; IBM, 2010) and (2) there is a difference between managing and governing IT.

Each of these two problems is discussed in the sections that follow.

2.5.1 Lack of insight into the IT environment

Even though companies with sound governance earn a higher return on assets, chief information officers (CIOs) believe that their executives have little insight into IT governance. IT governance is synonymous with using frameworks to facilitate and monitor the process, but using frameworks blindly will not necessarily lead to sound

IT governance, nor will it eliminate risks and achieve synergy between IT processes and business processes. The IT governance approach selected by the company should be specific to the business and the unique social environment of the business. (Willson & Pollard, 2009:107)

During 2007, PricewaterhouseCoopers, under guidance of the ITGI, facilitated interviews with 749 participants worldwide on IT governance issues, such as the risks involved and the value that could be generated. The *IT Governance Global Status Report – 2008* was aimed at containing data with regard to the recognition of IT governance importance, as well as frameworks used by companies to govern IT. The results indicated that greater emphasis is placed on IT, although communication between IT and business remains a struggle (ITGI, 2008b). The communication difficulty can directly be attributed to the lack of insight into the IT environment, which differs substantially from the business environment with which boards are familiar.

The IT environment encompasses architecture and processes or activities (Boshoff, 2010), while the IT architecture includes hardware and software components (Campbell *et al.*, 2009:12; PWC, 2010c), and IT activities are made up of a planning, implementation, execution and monitoring phase. It is essential that the IT governance framework adopted by the board to govern IT include all of these phases (Kordel, 2004:41; Bart & Turel, 2010:148–149).

What makes it even more challenging for a board is the fact that the IT environment is evolving continuously. Although businesses have traditionally needed IT on a basic level for recording transactions and information, the focus is shifting towards IT being able to engage with customers via e-business (HP, 2000). For a business to make this decision, it is vital to consider whether the IT environment can support this transition (Campbell *et al.*, 2009:13).

2.5.2 The difference between managing and governing IT

The second reason why problems are experienced with IT governance and alignment is that there is a difference between IT management and IT governance. IT management is about the responsibility for the day-to-day IT activities and could

be outsourced to an external party (Campbell *et al.*, 2009:8). IT activities include, among others, the following (Campbell *et al.*, 2009):

- configuration of the software and the hardware used;
- safeguarding on various levels of all business data;
- managing data processes; and
- maintaining the software and the hardware used, and investigating potential upgrades.

Based on the definitions of IT governance in Table 2.2, it is evident that IT governance is about the future of the business, ensuring that the IT environment sustains and enhances the business. The board should take ownership of the direction into which the company is steered and therefore IT governance cannot be outsourced (Campbell *et al.*, 2009:8; PWC, 2010c). This is supported by principle 5.1 of the King III report.

By differentiating between IT governance and IT management, it becomes apparent that deciding on an IT strategy is not merely a high-level decision. The alignment exercise includes having insight into all the aspects of IT, which include IT processes and IT architecture (Campbell *et al.*, 2009; PWC, 2010c). For alignment to succeed, business goals and processes and IT processes and architecture should be understood in depth (Kaselowski, 2008:18; IBM, 2010; Le Roux, 2010:49).

For businesses to be relevant and able to continue the status quo or to expand through innovation, it is important that the IT architecture and IT processes are governed appropriately. Based on the information in section 2.2, it seems vital for entities to apply the principles for IT governance as contained in the King III report.

The problems identified above are experienced by all entities, including public sector entities. Chapter 3 investigates the nature of the public sector and the impact of the King III report for the public sector.

CHAPTER 3

THE NATURE OF THE PUBLIC SECTOR: CONTEXTUAL DIFFERENCES BETWEEN THE PUBLIC AND THE PRIVATE SECTOR

3.1 Introduction

Public sector entities have a specific purpose to fulfil in order to enable citizens to experience quality life by providing the necessary services. The services provided by public sector entities include the following, among others (SAP, 2006; Gartner, 2010): building roads, schools and hospitals; providing education and health care; providing the infrastructure for electricity and sanitation; and safeguarding the country with the defence force.

Public sector entities have the obligation to provide services to all citizens in an ethical, fair manner (Fleming & McNamee, 2005:139), while they are using tax payers' money (Williams, 2009). As substantial amounts may be involved it is important that tax payers receive value services for the money paid (CIPFA, 2004). The only way to achieve the objective of providing value for money services to the public is by having sound corporate governance principles, policies and procedures in place. The public sector is very complex and diverse and guidance is needed to govern all elements effectively in an accountable manner (CIPFA, 2004).

Gartner (2010) argue that governments are operating in the most dissimilar trade. Their activities cover from local authority to national government and are spread from providing social care to defending the country. To make the challenge even greater, public sector entities also need to operate within a highly volatile political environment, with additional unique implications. Governments operate within a set budget process and are scrutinised by the public and opposing political parties (Gartner, 2010).

If the technology used by public sector entities is unreliable (including being not available, being inaccurate, being at risk of unauthorised access or not being able to deliver the service) or unable to keep up with national and international trends in the IT environment, the entity is at risk. The challenges that public sector entities face include the diverse stakeholders they often have, which lead to diverse objectives to reach. This ultimately complicates the matter of aligning the IT environment with the unique business objectives within the public sector (Hoch & Payán, 2008; Williams, 2009).

The most common definition for corporate governance in Australia explains it as the process used to steer entities towards its goals while keeping it accountable to society through risk assessments and the implementation of the necessary internal controls. Howard and Seth-Purdie (2005:58) contend that even this definition is not broad enough for the diversity and relationship constraints between departments within government. However, the question remains whether governing and managing the IT environment within the public sector require a different approach than for the private sector (Gartner, 2010).

The requirement of principle 5.2 of the King III report stipulates that an alignment exercise between IT and the business operations of the entity should be performed in order to reach the objectives of the entity. Therefore, not only is insight needed into the business environment and processes, but also into the IT environment, consisting of IT architecture and IT processes. The ITGI (2008c) found that due to the rapid changes in the IT environment, great focus was on IT governance and the main idea of aligning IT and business. Zaidenberg, Reignier and Crowley (2009) argue that the IT environment can only be developed sufficiently if one considers the 'context' in which the IT environment needs to function and operate.

Therefore, it is necessary to unravel the nature and characteristics of public sector entities. This is done in the next sections by first analysing international research findings and then findings from South African research to contextualise the differences between the public and the private sector.

3.2 International research

Several international research studies have been undertaken with a specific focus on the public sector environment of a particular country. The findings of these studies highlighted the differences between public sector entities and private sector entities.

In Table 3.1 the key findings of international studies that were considered relevant for this research are listed and identified. This is only a summary of findings that address various aspects of the findings and is not intended to be a complete list.

Table 3.1: International public sector studies: Key findings

Research	Country	Key findings
Howard & Seth-Purdie (2005)	Australia	<ul style="list-style-type: none"> • The public sector started to follow the private sector with regard to the implementation of corporate governance frameworks. • The governance frameworks are not sufficient for the public sector due to the wide range of functions fulfilled by government organisations. • Decision-making is influenced by national policy as well as local community needs.
Australian Government (2007)	Australia	<ul style="list-style-type: none"> • Good governance serves as an enabler of an entity. • Governance frameworks should vary based on the nature of the entity.
Sethibe <i>et al.</i> (2007)	Australia	<ul style="list-style-type: none"> • Public sector entities do not invest much into IT. • Public sector entities have to provide a given service, while private sector entities base their decisions with regard to products or services on profit considerations. • From an organisational perspective there should be a variation on the governance frameworks used by entities in the two different sectors.
Wijsman <i>et al.</i> (2007:20–22)	The Netherlands	<ul style="list-style-type: none"> • A lack of strategic planning was identified within the IT environment for the public sector. • IT is not a mere addition to a business, but is vital for operating, sustaining and improving the business. • IT should lead to greater client interaction and improved service delivery.
Broadbent, Gallop & Laughlin (2008a)	United Kingdom	<ul style="list-style-type: none"> • Values and value systems have a significant impact in the public sector environment.

Research	Country	Key findings
Broadbent, Gallop & Laughlin (2008b)	United Kingdom	<ul style="list-style-type: none"> • The contextual differences between the public and the private sector create difficulty when the same governance frameworks are implemented. • A standardised approach for governance and accountability across sectors is creating problems within the public sector.
Jó & Barry (2008)	Portugal	<ul style="list-style-type: none"> • An entity will be structured based on the vision and objectives of the entity.
Campbell <i>et al.</i> (2009)	Australia	<ul style="list-style-type: none"> • The continued change in IT towards online functionality has opened the door for government organisations to interact more easily and readily with citizens. • Online functionality should be effective and free of errors. • Public sector entities operate within a fragmented environment that is clouded with bureaucracy. • Changes in political powers often lead to restructuring – there is a constant assessment of current structures and possible improvements. • Accountability should be provided to a range of stakeholders – ranging from an individual citizen to parliament. • Due to the intrinsic difference between the public and the private sector, there should be a different approach in governing these entities. • Organisational structure and the decision-making rights determine the IT governance. • High reliance is placed on contract IT staff. This situation contributes to a poor in-house knowledge pool.

Research	Country	Key findings
Crawford & Helm (2009)	Australia	<ul style="list-style-type: none"> • The public sector is under pressure (from opposition political parties and the public) to be transparent and accountable to use taxpayers' money to deliver tangible outcomes. • Focus is needed on governance, especially with regard to the enhancement of infrastructure. The IT environment is part of the infrastructure of public sector entities. • Public sector entities have greater budgetary constraints, greater complex regulatory requirements and struggle to attract staff when compared to the private sector.
Bart & Turel (2010:149)	Canada	<ul style="list-style-type: none"> • Businesses find themselves within a specific IT environment. The focus of the environment will either be reliable or innovative. Governance frameworks should be developed based on the focus of the IT environment.
Nfuka & Rusu (2010a)	Tanzania	<ul style="list-style-type: none"> • Effective IT governance is still a long way into the future for developing countries. • IT governance should be broad enough to include all the aspects of IT life cycles.
Nfuka & Rusu (2010b)	Tanzania	<ul style="list-style-type: none"> • Public sector entities rely on IT to deliver the required outcomes. • Public sector entities are under pressure to provide a quality service at an affordable price. • Services are for the general public. • Government institutions are divided into several departments that are vastly spread with regard to location and objectives. • Based on the previous finding, it remains a challenge to maintain, operate and govern IT in such an environment.

From Table 3.1 it is evident that researchers from various countries agree that the unique environment in which a public sector entity operates requires a unique approach and ultimately IT governance framework to govern IT in the public sector.

Findings of research performed in the South African context are discussed below. This discussion is followed by a summary of the contextual differences that exist between the public and the private sector.

3.3 South African research

The private sector generally focuses on generating profit by being efficient and effective and stakeholders will indicate whether they are satisfied or not (PWC, 2010b). According to Woods (2010) this is currently not the case in the public sector in the South African context. With the introduction of the King III report, greater emphasis is placed on ownership and responsibility. In the South African context parliament will have to fulfil this role by determining how each department should apply the principles of the King III report, even though the real stakeholders are the general public (PWC, 2010b).

The public sector overspends more frequently on IT projects than the private sector – mainly due to lack of insight into the IT environment by decision- and policy-makers. The process of decision-making takes time and decision-makers need to go through several points of authorisation, leading to increased cost and loss of opportunity benefits. The procurement process is also heavily regulated, which might hinder the selection of a provider or contract. Government institutions should only acquire IT hardware and applications that are specific to the need of the department. However, very often the public sector acquires applications or hardware that is too advanced for the specific entity or department, which complicates matters. Without the required insight into the business operations as well as the IT environment operations, it is not possible to acquire the hardware and software that addresses the particular need of a department. To be effective and efficient, the IT environment in totality should be aligned with the needs and goals of the business, thereby including architecture such as hardware, networks and software. (Woods, 2010)

The guidelines that are specific to IT development on local authority level are limited. This situation could lead to reluctance by local authorities to invest in IT. The reality is that each local authority tries to manage IT by developing own little 'knowledge pools' which results in a *specific* IT program being run on a *specific* computer by a *specific* staff member. This is not an ideal situation, since it creates a void of knowledge when a *specific* staff member retires or resigns and it complicates matters when different local authorities need to report to provincial government, since no standardised reporting is available (SAP, 2006; Kaselowski, 2008:84–85).

The situation sketched above was evident in the City of Cape Town (SAP, 2006). The City of Cape Town consists of seven municipalities. Before the installation of a single SAP system each municipality had operated and maintained its own secluded, out-dated and insufficient IT system – making it impossible to report on the performance of the City as a whole (SAP, 2006).

Not only does the public sector need to manage the challenge of a volatile political environment, but based on the industry of the department, specific legislative requirements might be applicable. These could also have an impact on the IT environment (PWC, 2010a).

From the research findings recorded in section 3.2 and 3.3 it is apparent that the findings of the international research are similar to the findings within the South African context. Based on these research findings, Table 3.2 below provides a summary of the aspects that the author identified as the main contextual differences between the public and the private sector.

Table 3.2: Summary of contextual differences between the public and the private sector

Public sector	Private sector
Decision-making time-line long	Quicker to make decisions and not so many levels of authority to pass
Depend on contract IT staff	Appoint full-time IT staff members
Difficult to attract qualified staff, due to salary constraints	Less difficult to attract staff
Dissimilar trade	Specific trade
Diverse stakeholders – difficult to have clear and measureable objectives that are not in conflict	Clear objectives from stakeholders
Environmental constraints	Only applicable, depending on the nature of the company
Follower of trends in the private sector, which might not be relevant or applicable	Set trends for the specific needs of a private sector entity which is about safeguarding stakeholders' investment
Fragmented – in location and trade	Uniform
Need reliable IT, but not great investment in IT	Need innovative IT to keep ahead of the market, which could result in great investment in IT
Obligated to deliver a service	Make decisions based on profit considerations only
Overly regulated and bureaucratic	Stakeholders want transparency and accountability
Policy-driven	Profit-driven
Provides service at lowest cost to client	Driven by profit
Restructuring on the table when change occurs in political or economic environment	Less prone to restructuring unless driven by market conditions

Public sector	Private sector
Set budget process – driven by policy	Budget process more flexible – driven by profit
Social responsibility	Driven by profit
Staff retention high	Staff retention lower
Volatile political influence	Stakeholder input
Weak in corporate governance, including IT governance	Stronger in corporate governance

In Chapter 3 the unique nature of the public sector entity, which is different to that of a private sector entity, was explored. In Chapters 4 and 5 the impact of these identified unique characteristics on the IT environment of the public sector entity are discussed.

CHAPTER 4

BUSINESS PROCESSES AND THE IMPACT ON THE IT ENVIRONMENT

4.1 Business processes

Principle 5.2 of the King III report stipulates that the IT environment should be aligned with the business objectives of the entity. The purpose of the public sector entity is to provide a service to the public, and IT is integral to delivering the particular service(s) (IODSA, 2009).

To deliver public sector specific services to the public, whether it is to build a road or provide education, specific business processes are followed to achieve the required outcomes. The phases within the business processes are:

- Plan
- Design
- Build
- Operate / Maintain (Jó & Barry, 2008; Boshoff, 2010).

Figure 4.1 illustrates these phases as a diagram.

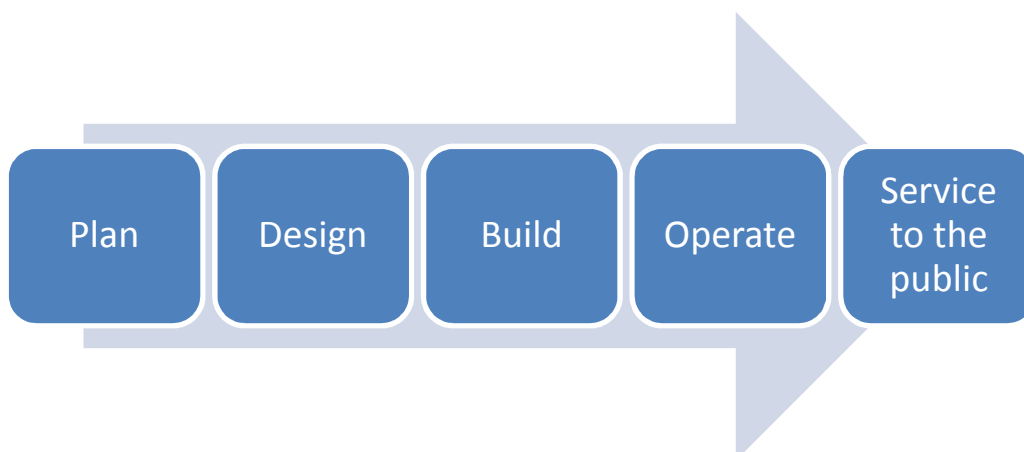


Figure 4.1: Phases in the business processes of a public sector entity to provide the required services

As discussed in Chapters 1 and 2, IT is integral in achieving the required tangible objectives of the company. IT, therefore, has a function to fulfil in each phase of the business process.

Gartner (2009), Boshoff (2010), Nfuka and Rusu (2010b) and Raquel and Andrade (2010) all identified that IT entails similar building blocks, based on project management principles, as identified in the business processes above, in order to support and enable a business. Figure 4.2 illustrates these building blocks.

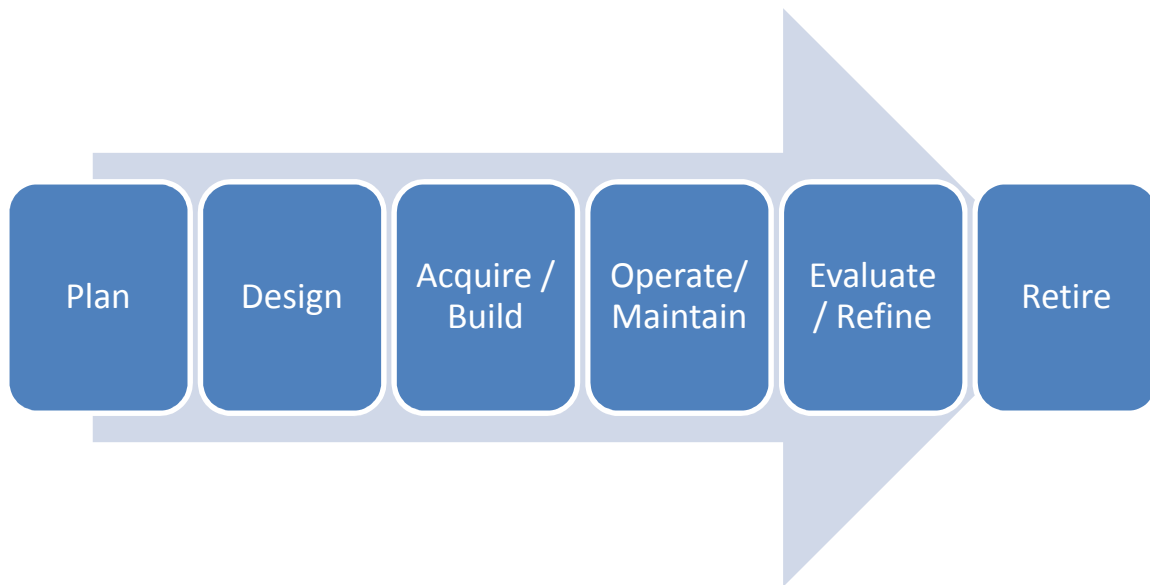


Figure 4.2: Building blocks within information technology (IT)

Therefore, the building blocks within IT are applicable in each of the phases of the business processes. In Figure 4.3 the IT building blocks are combined as supportive and enabling agents for the business processes.

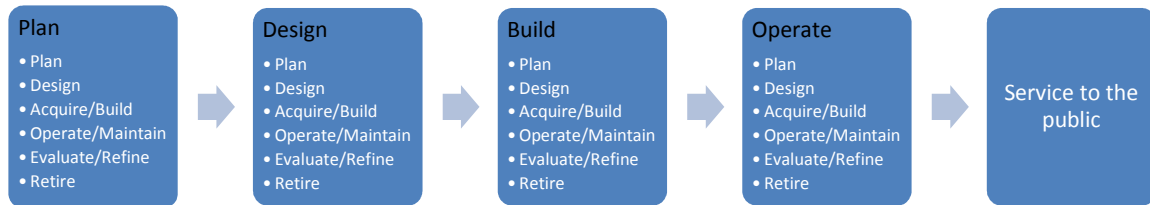


Figure 4.3: IT building blocks applicable to the phases in the business processes

4.2 Impact on the IT environment

In Chapter 3 the unique nature of the public sector was explored and in Table 3.2 a summary was provided of the key differences between the public and the private sectors. In Table 4.1 these differentiating characteristics of the public sector (from Table 3.2) are used to identify whether these specific qualities have an impact on the IT environment (discussed in section 4.1), and if so, to indicate in what way they affect this environment.

Table 4.1: Impact of the intrinsic public sector nature on the IT environment

Public sector characteristic	Impact on the IT environment
Decision-making time-line long	IT is a rapid changing environment and public sector entities either buy an out-dated product or they buy an overly complicated system in anticipation of the long time-line
Depends on contract IT staff	Lack of in-house IT-related knowledge
Difficult to attract qualified staff, due to salary constraints	Lack of qualified permanent staff members to have insight into and contribute to supporting the business
Dissimilar trade	IT environment needs to be aligned to sustain and enhance various goals
Diverse stakeholders – difficult to have clear and measureable objectives that are not in conflict	No direct impact
Environmental constraints	Implementation and upgrading of systems could be impacted
Follower of trends in the private sector, which might not be relevant or applicable	Not able to support the business
Fragmented – in location and trade	Could lead to increase in costs and difficulty in maintaining and managing the IT environment
Needs reliable IT, but not great investment in IT	Systems are often neglected in order to reduce costs
Obligated to deliver a service	No direct impact
Overly regulated and bureaucratic	Inappropriate IT software or hardware could be procured due to risk averseness and red tape
Policy-driven	No direct impact

Public sector characteristic	Impact on the IT environment
Provides service at lowest cost for client	Systems are often neglected in order to reduce costs
Restructuring on the table when change occurs in political or economic environment	The organisational changes might not consider how the IT environment can support the business
Set budget process – driven by policy	No direct impact
Social responsibility	No direct impact
Staff retention high	Lack of in-house knowledge
Volatile political influence	No direct impact
Weak in corporate governance, including IT governance	Leads to failures (e.g. not the appropriate IT software, or expenses exceed the budget) in the IT environment

4.3 Business imperatives

Based on the nature of the entity, any entity has specific business imperatives (Boshoff, 2010). Boshoff (2010) defines a business imperative as a non-negotiable prerequisite principle, imposed by management, which needs to be achieved in order to enable the company to reach its strategic business objectives in the specific environment.

Literature was reviewed and six imperatives were identified as the key business imperatives for a public sector entity (Selig & Waterhouse, 2006; ISACA, 2008; ITGI, 2008c; Crawford & Helm, 2009:76; IODSA, 2009; Boshoff, 2010; Butler & Butler, 2010:36; McKinsey Quarterly, 2010; Woods, 2010). Table 4.2 identifies the business imperatives for a public sector entity and provides a brief description of the imperative from a business requirements perspective.

Table: 4.2: Business imperatives for a public sector entity

Imperative	Business requirements
Affordability	Public sector entities require IT costs to be low and are focused on value for money. The benefits received from the IT environment should outweigh the cost. Costs of ownership and operating costs should be low in order to utilise taxpayers' money efficiently in transforming it into tangible outcomes for society.
Agility	The IT systems should be able (flexible) to adapt to changes in political power, restructuring possibilities and changes in the economy. The IT systems should also be able to adapt to provide easier methods of interaction with the citizens.
Ease of use	The IT technology should be easy to use for all users. It should not be too complex, which could lead to idle time, mistakes and the requirement for highly skilled staff. Since decisions are made based on information captured it is important to limit mistakes. The entities also want to limit unnecessary expenditure on IT training caused by complex systems.
Reliability	Systems need to function as intended at all times to be available, effective and efficient.
Security	Access to the personal data of citizens should be safeguarded to prevent unauthorised access to such information. Unauthorised transactions should also be prevented.
Self service	Entities want citizens to be able to perform certain tasks (such as register for tax purposes) directly and quickly themselves.

When aligning the IT environment with the business objectives of the entity as required by principle 5.2 of the King III report, the IT environment should therefore be aligned with these business imperatives (IODSA, 2009).

4.4 Analysing the IT environment

The subject matter of the IT environment is technical by nature. The purpose of this section is not to gain in-depth knowledge of the IT environment, but rather to identify aspects that should be considered when the business processes are aligned with the IT environment.

IT has become integral to all businesses, and principle 5.2 of the King III report requires that the IT environment of an entity be aligned with the business processes to enable the entity to achieve its objectives (IODSA, 2009). In section 4.1 the business processes were discussed by analysing the unique characteristics of a public sector entity. This section (4.4) identifies the IT environment and focuses specifically on what the environment consists of and how it could be aligned with the business objectives of the entity.

The IT environment can be broadly categorised into the following clusters which consists of various components (Merhout & Havelka, 2008:464; Ali & Green, 2009; Cisco, 2009; Boshoff, 2010; Buckow & Rey, 2010; McKinsey Quarterly, 2010; The Open Group, 2011):

- Applications e.g. SAP software
- Databases e.g. SQL
- Hardware e.g. Desktops
- Middleware e.g. General ledger integration
- Networks e.g. LAN
- Operating systems e.g. Windows 7

Figure 4.4 below illustrates the IT environment diagrammatically.

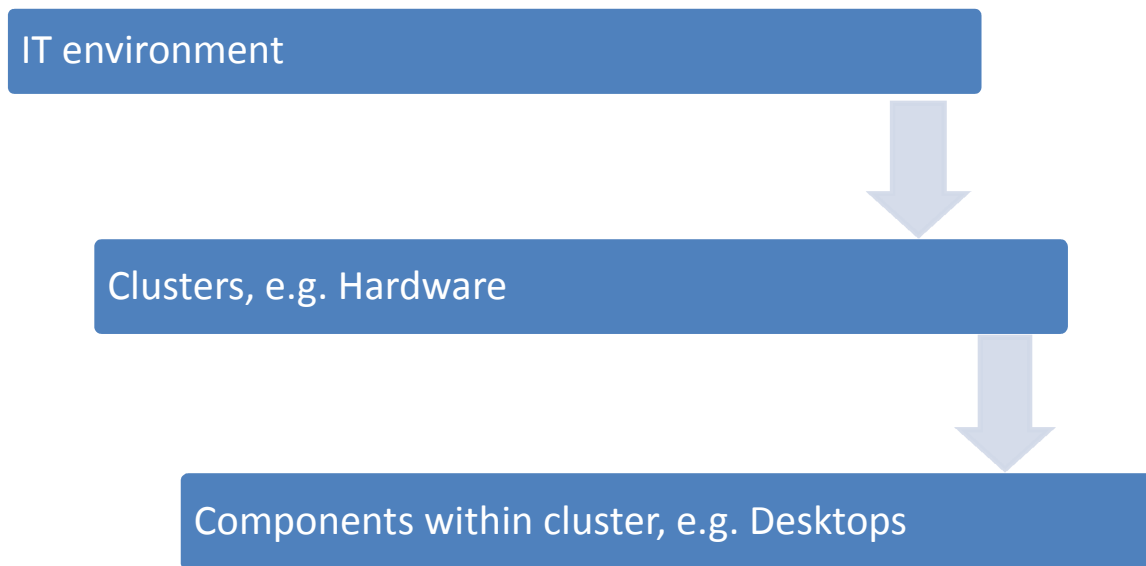


Figure 4.4: Analysis of the IT environment

For the purposes of this study the author did not explore these components in depth – the concept of the clusters and the components thereof are used for the conclusion of the alignment exercise as required in principle 5.2 of the King III report.

Boshoff (2010) established that every component within the cluster of the IT environment is exposed to the one or more of the following actions:

- Build
- Set up
- Configure
- Operate
- Maintain

Table 4.3 below provides a definition for each of the above actions (The Free Dictionary, 2011) as well as an explanation of the definition from an IT perspective (Boshoff, 2010).

Table 4.3: Defining component actions from an IT perspective

Action	Definition	IT perspective
Build	'To make something by combining materials or parts'	To assemble various components in order to function as a computer
Set up	'The way in which something is constituted, arranged or planned'	Installation of the program on a computer system
Configure	'To design and arrange with a view to specific applications or uses'	Creating configuration files for user applications
Operate	'To control the functioning of'	The running of the hardware and software
Maintain	'To keep in a condition of good efficiency'	The upgrading of software to ensure reliability

4.5 Conclusion

Chapter 4 dealt with part one of principle 5.2 of the King III report by focusing on the business processes of a public sector entity. Principle 5.2 states that the IT environment should be aligned with the business processes in order for the entity to reach its objectives. By recognising that the unique nature of the public sector determines specific business imperatives for the entity and by following the phases in the business process, a service could be delivered to the public. Each of these has an impact on the IT environment and vice versa.

Figure 4.5 below summarises the findings presented in Chapter 4, where the focus was on the characteristics, business imperatives and business processes of a public sector entity. In Chapter 5 the alignment principle is concluded by focusing on the IT environment.

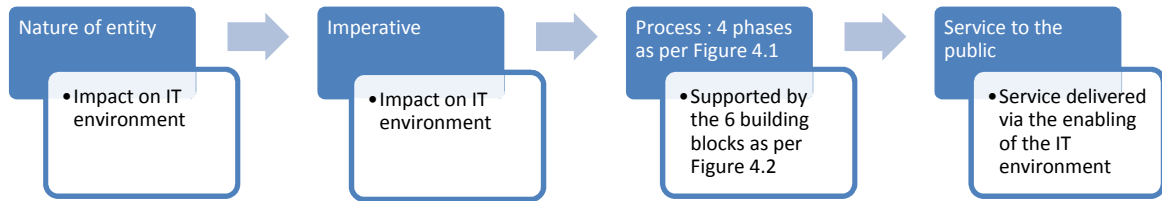


Figure 4.5: Nature of entity determines the outcome delivered: Supported by the IT environment

CHAPTER 5

ALIGNING BUSINESS IMPERATIVES WITH THE IT ENVIRONMENT

In Chapter 3 the unique nature of a public sector entity was discussed and in Chapter 4 business imperatives for the public sector were identified and recorded (Table 4.2). These business imperatives should be aligned with the IT environment, as identified in section 4.4, in order for the business to achieve its objectives.

After the analysis of the IT environment in section 4.4 it was concluded that the IT environment consists of various clusters and that these clusters consist of various components. When principle 5.2 of the King III report therefore proposes that the IT environment should be aligned with the business processes, then insight is needed into both the business processes and the components of the IT environment.

The impact of the business imperatives of the public sector (identified in Table 4.2) on the IT environment (analysed in section 4.4), were evaluated and recorded in Table 5.1 below. This table provides the last step towards achieving the alignment between the IT environment and the business objectives of the entity as required by principle 5.2 of the King III report. A golden line was created from the nature of the entity to the impact thereof on the clusters of the IT environment, resulting in alignment between the business processes and goals and the IT environment.

Table: 5.1: Business imperatives: IT environment perspective

Imperative	Business requirements	IT Environment	Clusters impacted
Affordability	Public sector entities require IT costs to be low and are focused on value for money. The benefits received from the IT environment should outweigh the costs. Cost of ownership and operating costs should be low in order to utilise taxpayers' money efficiently in transforming it into tangible outcomes for society.	The cost of ownership of particular IT software and hardware needs to be as low as possible. This includes the initial purchase price, annual licence fees and the costs associated with upgrades and maintenance.	Applications Hardware Networks
Agility	The IT systems should be able (flexible) to adapt to changes in political power, restructuring possibilities and changes in the economy. The IT should also be able to adapt to easier methods of interaction with the public.	The hardware and applications need to facilitate various systems, since a public sector entity is diverse in its trade and has various stakeholders. It should be easy to upgrade and maintain the system.	Applications Hardware

Imperative	Business requirements	IT Environment	Clusters impacted
Ease of use	The IT technology should be easy to use for all users. A complex system is not desirable as it could lead to idle time, mistakes and the appointment of highly skilled staff. Decisions are made based on information captured and therefore it is important to limit errors. The entities also want to limit the expenditure of IT training required by complex systems.	The user interface should generate an experience for users that is not demoralising. The response rate and the content should encourage users to finalise tasks quickly and effectively. The business process should be logical, prompting for the next procedural step, require the successful completion of a step before the user can move to the next step, and have a help function.	Applications

Imperative	Business requirements	IT Environment	Clusters impacted
Reliability	Systems need to function as intended at all times, thereby being available, effective and efficient.	The systems should be of a reliable quality to avoid malfunctioning. The systems should also be able to adjust to unexpected changes with minimal damage. A detailed contingency plan should be in place. A continual monitoring system that monitors availability of systems should also be in place.	Applications Hardware Network
Security	Unauthorised access to the personal data of citizens should be prevented.	Data must be kept in a valid, accurate and complete manner. Appropriate firewalls, anti-virus programs and facilitation of administrators' rights should be in place.	Applications Hardware Network

Imperative	Business requirements	IT Environment	Clusters impacted
Self-service	Entities want citizens to be able to perform certain tasks (such as register for taxation) directly and quickly themselves.	Online functionality should be developed and activated. User-friendly interfaces should be used to eliminate errors. A help function should be available and users should be guided step-by-step in a logical manner.	Applications

From Table 5.1 above, it is evident that based on the nature of the public sector entity and the business imperatives selected, the IT environment (clusters and components) is impacted.

Based on the research, the implication is that the components of the IT environment should be aligned with the business processes. In this way true alignment between the IT environment and the business objectives of the entity can be achieved and the public sector entity will be able to deliver the required service(s) to the public. Principle 5.3 of the King III report identifies the need for a framework to be selected by the board in order to govern the IT. Based on the information in Chapters 3 to 5, it is evident that this chosen framework assists in aligning the IT environment with the business processes.

Chapter 6 addresses principle 5.3 of the King III report with regard to the applicable framework to govern IT in the public sector.

CHAPTER 6

AN IT GOVERNANCE FRAMEWORK FOR THE PUBLIC SECTOR

6.1 The need for an IT governance framework

The King III report introduced the concept of IT governance in the South African context (IODSA, 2009). To date no estimates are available to determine the adoption percentage of IT governance by South African entities (Marnewick & Labuschagne, 2011). Chapter 5 of the King III report identified seven IT governance principles, as recorded in Table 2.1, which all entities should apply. The focus of this research was on the application of principles 5.2 and 5.3 of the King III report to the public sector entity in particular. Principle 5.2, which deals with the alignment between the IT environment and the business objectives of the entity, was discussed in Chapters 3 to 5. Principle 5.3, which addresses the need for the adoption of an IT governance framework to assist in achieving IT governance, is discussed in Chapter 6.

In an interview the World Bank's CIO, Shelley Leibowitz, stated that technology can enable a company to achieve its objects if it is used effectively (McKinsey Quarterly, 2010). Leibowitz considers the flow of information via hardware, networks and applications as both critical for businesses. Therefore, the components as well as the information should be safeguarded and managed accordingly (Ali & Green, 2009; McKinsey Quarterly, 2010). Merhout and Havelka (2008:466) add to this argument by stating that businesses should govern their IT environment responsibly – due to the significant costs accumulated by these components and because all financial information and data are generated and stored in the IT environment. Appropriate controls are thus needed to ensure that the IT environment is supporting and enabling the business to excel (Supangkat, Rahmat & Sembiring, 2006).

Failures in the IT environment occur when risks are not identified and appropriately addressed. Governing principles are needed for the IT architecture, applications and processes, but mere compliance will not result in a risk-free environment. To address

the risks, input is needed from all stakeholders. In addition, insight into the business needs and the components of the IT environment is required (Faber & Faber, 2010).

As a result of their lack of knowledge, Board members and management have traditionally been reluctant to take responsibility for the IT environment. For stakeholders to be able to communicate the required needs in such a way that they understand each other, the difference between IT technical terminology and business terminology remains a challenge in the process of governing IT effectively (Weill, 2004:9).

The field of IT governance deals with structures, processes and mechanisms, as indicated by the definitions of IT governance contained in Table 2.2. The purpose of IT governance is to align the IT environment with the business strategy as required by principle 5.2 of King III and to create accountability to all stakeholders of all assets held.

Principle 5.3 of the King III report states that South African businesses should adopt and implement a framework to govern IT. A framework is defined as a structure, consisting of various parts and processes, intended to serve as a guide to create value (The Free Dictionary, 2011; Whatis, 2011; Wiktionary, 2011). Various frameworks exist to guide the implementation of IT governance in order to align the business environment with the IT environment (ITGI, 2003; Supangkat *et al.*, 2006). However, no single framework is sufficient on its own, and to incorporate all will have little value (*The Calder-Moir IT Governance Framework*, 2010).

Even though it is evident that successful companies gain from their IT assets, the problem is that many companies only focus on the legislative requirements forcing them to adopt a framework, without really benefiting from the value that derives from governance (Weill, 2004:10; Selig & Waterhouse, 2006). This situation seems to be changing as more companies are currently adopting governance frameworks enabling them to think strategically about assets, including IT investments (Sethibe *et al.*, 2007).

6.2 Analysis of widely-used generic frameworks

A variety of generic frameworks exist to manage IT in order for IT to add value to the business (Nfuka & Rusu, 2010b) and to assist in the process of IT governance. Companies tend to use renowned frameworks as reference for obtaining IT governance principles (ITGI, 2008b).

The most widely-used frameworks are the following (Tansley, 2007:27; IBM, 2010; Nfuka & Rusu, 2010b):

- **Control Objectives for IT (COBIT)**

COBIT is a framework of best practices for IT management and IT governance (Tansley, 2007:30; Boshoff, 2010; Wikipedia, 2011) created by ISACA. COBIT focuses on the monitoring of different IT processes while narrowing the gap between the business and the IT side of the entity (Tansley, 2007:32; IBM, 2010; Rudman, 2010). COBIT is therefore a high-level control framework (ITGI & OGC, 2005). The four domains that COBIT address are Plan and Organise, Acquire and Implement, Deliver and Support and Monitor (ITGI & OGC, 2005; Tansley, 2007:31). COBIT's aim is to be of use to all entities, bearing in mind that entities should consider the relevance to their unique circumstances (ITGI & OGC, 2005).

- **The IT Infrastructure Library (ITIL)**

ITIL, a framework of best practices for quality IT service delivery, was developed in the United Kingdom public sector (Symons, 2005; Tansley, 2007:41; Arraj, 2010; Faber & Faber, 2010; IBM, 2010). Since ITIL focuses on the IT services that are needed by the business to achieve its objectives, it is geared towards processes (ITGI & OGC, 2005; Boshoff, 2010; Wikipedia, 2011). The domains that ITIL address are Service Support and Service Delivery (Tansley, 2007:42).

6.3 Challenges in adopting the widely-used generic frameworks

Although frameworks should be able to assist with governance, they are sometimes overly complex and too detailed. In addition, there is no framework that offers the perfect answer and if companies consider various frameworks in combination, they often become confused (Calder, 2008).

Even though frameworks for IT governance are available and widely used, all frameworks, standards and best practices have strengths and weaknesses (Hoekstra & Conradie, 2002). Hoekstra and Conradie (2002), Wijsman *et al.* (2007:22), ITGI (2008a) and Rudman (2010) argue that COBIT is a high-level control tool, but does not provide the required technical particulars or detail needed. Hoekstra and Conradie (2002), Arraj (2010) and Supangkat *et al.* (2006) contend that since ITIL focuses mainly on processes, ITIL on its own is not sufficient as a governance tool and should be used in collaboration with other frameworks. However, the *IT Governance Fact Sheet* (S.a.) states that there is a strong relationship between ITIL and COBIT and when used in conjunction they address high-level and low-level controls and tasks.

The IT governance frameworks that are available are all only a set of best practices and not an 'off-the-shelf' solution for governance that would suit every business (Lew, 2008). Since various frameworks are available, management need guidance about how to use them in conjunction, if the need exist. The mere fact of the need to combine these frameworks indicates that each has a unique purpose, but none is an absolute answer. This is supported by the King III report that states that a 'one size fits all' approach is not possible (IODSA, 2009).

The adoption of standards, best practices and frameworks does not guarantee success – it is all about the implementation, continuous monitoring and improvement

from the business perspective that will lead to effective and efficient IT environments that will support the business to grow (IBM, 2010). Standards, best practices and frameworks need to be altered to suit the specific needs of the business and organisational structure (Hoekstra & Conradie, 2002; ITGI, 2008a). The challenge is to govern the various frameworks and to be certain that the IT architecture and processes are supporting the business processes of the particular entity (IBM, 2010).

There is a concern that frameworks and standards are used for the sake of having them, but with no insight into the meaning, implication and functioning of the IT environment. The frameworks should generate insight and understanding and provide board members with strategic focus (ITGI, 2008a). If not, then the frameworks become expensive and document exhaustive, without adding any value (Rudman, 2010).

As identified in section 4.4, the IT environment consists of various components that should all be aligned with the business by being build, set up, configured, operated and/or maintained. Generic frameworks provide detailed information about processes and strategy, but are not able to give any detail specific to an entity with regard to the alignment of the components of the IT environment. In-depth knowledge of both the business needs and the IT environment is required to succeed with the alignment exercise, and therefore an entity should select and adapt a framework to support this concept. A framework should address the business needs, particularly also the practical aspects of the IT environment (components), and it should satisfy the requirements of stakeholders and users (Boshoff, 2010).

In the following section recommendations are made on how the public sector could address the challenges faced in the use of generic frameworks.

6.4 Recommendations for the public sector

Due to the unique challenges within the public sector, a sub-committee of the King III committee was formed to investigate the application of the King III report for the public sector in particular and to make some recommendations (SANGONet, 2011) in line with international practice. This followed after the King Report was previously criticized for focusing solely on commercial entities although it is applicable to all entities, including the public sector (Temkin, 2011). Therefore, the King III report was not specifically adapted to suit the unique context of the public sector and since the sub-committee's work is still in progress, no recommendations have been published to date.

Just as the King III report in its entirety is not applicable to all entities in all sectors it might be true for other control frameworks that are adopted. Since public entities have to comply with other legislation such as the Public Finance Management Act and the Municipal Finance Management Act, the challenge will remain to map the King III report requirements with those of these two Acts and to implement those at large (PWC, 2010b).

Therefore, since public sector entities are without guidance in the process of IT governance, sections 6.4.1 and 6.4.2 aim at recommending two aspects that public sector entities should consider in terms of governing IT.

6.4.1 Consider the nature, organisational structure and IT environment of the entity

Various approaches and frameworks are available and could be selected to achieve IT governance (ITGI, 2005; Macgregor, 2010). As each business is unique it should adopt an approach that suits the specific company (Butler & Butler, 2010:38). It therefore follows that the public sector entity should adopt or develop an IT governance framework that suits the need of that particular public sector entity.

The framework selected to govern the IT environment for the public sector entity should be influenced by the specific IT environment applicable and all aspects of the IT environment should be covered by the framework (Liell-Cock, Graham & Hill, 2009; Butler & Butler, 2010:38). Consideration should be given to the contextual environment of the entity to determine whether the requirements of the entity are a reliable and secure system and/or systems that can take the business forward in innovative ways (Bart & Turel, 2010:168). The framework that is implemented should utilise the strengths from various available frameworks and be specifically tailored to the unique business requirements of the public sector entity. Any framework is better than nothing, since at the very least it provides structure. A tailored framework will automatically mean that understanding of business needs and the IT environment was obtained and that sufficient alignment is possible, which will result in achieving objectives and minimising risk associated with the public sector entity (Butler & Butler, 2010:43).

The framework selected by the public sector entity should address the where, what, why, who and how of the IT architecture of the enterprise (Moir, 2008; The Open Group, 2011). An important aspect to consider when aligning IT with business needs is to be able to communicate clear objectives, using terminology that could be interpreted by knowledgeable IT staff as well as knowledgeable business staff. To create value from IT, it is important for those responsible for the business processes to be educated with regard to IT challenges and risks and IT components (ITGI, 2005; Buckow & Rey, 2010).

In Chapter 3, some of the unique challenges of the public sector were identified. Specific reference was made to the different systems used by different departments within government and it was pointed out that this is a contributor to the inefficient service delivery by IT systems. The framework selected or developed for the public sector should be able to address this challenge. If public sector entities apply the IT governance principles put forward in the King III report there will be a swift of focus towards governing all IT processes and architecture effectively, in order to achieve the required service delivery (Campbell *et al.*, 2009).

6.4.2 Top-bottom *versus* bottom-top frameworks

Another challenge that public sector entities should be aware of is that IT control frameworks often provide only a top-bottom view with broad strategic guidance and little practical guidance about processes and tasks to achieve the required outcomes. Although all companies are in need of a top-bottom directional framework, they also need practical hands-on guidance about processes, tasks and implementation in order to reduce cost but still receive value from the IT environment (Selig & Waterhouse, 2006).

Leopoldi (2005) specifically pointed out that a top-bottom framework could be limiting for entities operating in a diverse field and having complicated organisational structures. As both of these characteristics are integral to the public sector environment as illustrated in Chapter 3, it means that the public sector entity requires something in addition to the mere top-bottom view provided by certain IT control frameworks.

The IT governance framework for the public sector should be based on the intrinsic nature of the sector and a combination of a top-bottom and bottom-top approach is recommended. As the nature of the public sector entity will have an impact on the business processes and the service that is delivered to society, the IT environment should support these business processes. This could be governed with a top-bottom strategic approach. (Chase, 2006)

On the other hand, little value will be added if only a top-bottom approach is selected. One of the purposes of the King III report and IT governance is to create an awareness of and insight into the IT environment and all the technical components thereof. In order to truly align the business needs of the public sector entity with its IT environment, one should consider a bottom-top approach, whereby the IT components are aligned with the business imperatives which are in turn based on the nature of the entity (Boshoff, 2010).

Since a top-bottom and a bottom-top approach fulfil different purposes, both are needed for IT governance in the public sector entity. While top-bottom implies that the plan is to build something that suits the need of the business, the bottom-top approach will ensure that it is actually built. If both viewpoints are used in a collaborative way, it will lead to ultimate benefits. If one wants to build IT architecture one needs to *know* what to do and how to do it. The knowledge has to be communicated appropriately in order for the business stakeholders and IT stakeholders to understand each other (Chase, 2006).

By combining the two approaches and focusing on the unique environment of the public sector entity, a governance framework can be established. The result of this framework will be that insight has been gained into the IT environment and the business processes and that true alignment between the business and the IT environment has been achieved.

Based on the research and the deductions made, Figure 6.1 illustrates the IT governance framework needed in the public sector.

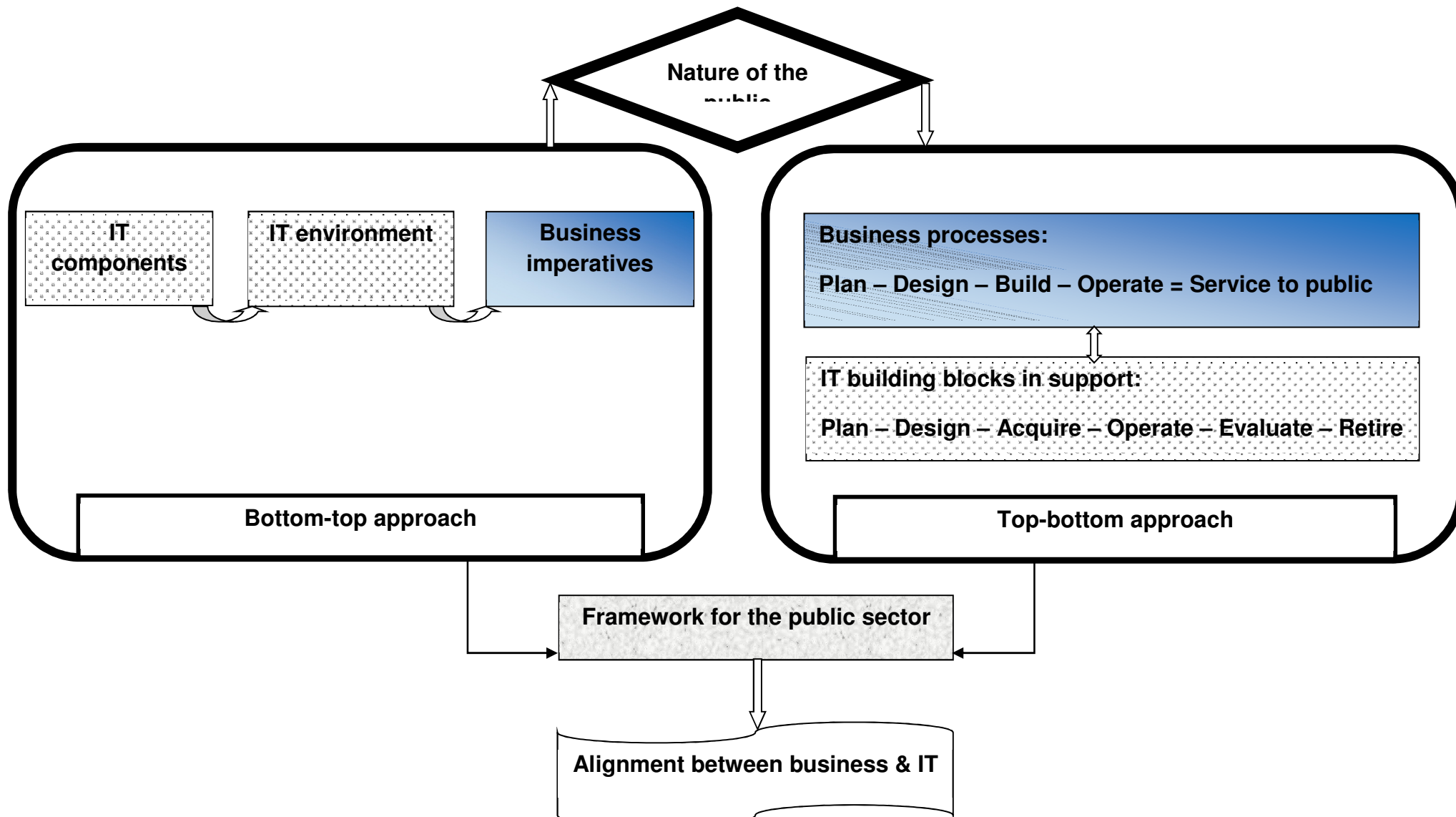


Figure 6.1: An IT governance framework for the public sector

CHAPTER 7

CONCLUSION

Traditionally, public sector entities struggle to gain any value from the IT environment and regularly overspend on IT projects. However, IT is a vital element in the delivery of the required outcomes for the specific stakeholders (Nfuka & Rusu, 2010b; Woods, 2010). The Third King Report on Corporate Governance (King III) became operational in South Africa on 1 March 2010. The King III report is the first corporate governance report in South Africa that is applicable to all entities, thus including public sector entities. It highlighted a new category of corporate governance in the South African context, namely 'The governance of information technology (IT)' (IODSA, 2009). Public sector entities are required to govern IT effectively while applying the principles set out in the King III report.

Taking into account the unique nature of the public sector entity, the purpose of this study was to assist public sector entities in their IT governance efforts through the development of a framework to be used to govern IT effectively. For the purposes of this research the focus was on principles 5.2 and 5.3 of the King III report, highlighting the need for a governance framework to achieve alignment between the business needs and the IT environment in the public sector.

Since the nature of a public sector entity is different to the nature of a private sector entity, the governing thereof should be different as well (Gartner, 2010). Principle 5.2 of the King III report was addressed in Chapters 3 to 5 by identifying the unique characteristics (Chapter 3) and the associated business imperatives (Chapter 4) of the public sector. It was further established that the business imperatives have a specific impact on the IT environment and that true alignment can only be achieved when insight is gained into both the business and the IT environment. Without insight into both environments, alignment will never be achieved (Boshoff, 2010).

In Chapter 6, principle 5.3 of the King III report was addressed by discussing the need for a framework to govern IT. The challenges in using generic IT governance frameworks such as COBIT and ITIL were discussed. No 'one size fits all' framework exists for governing purposes (IODSA, 2009), but when entities use frameworks in conjunction, there is greater chance of achieving alignment. This however, normally equates to a complex paper exercise with little real value (ITGI, 2008a; Rudman, 2010).

Generic frameworks are usually prone to a top-bottom approach that provides strategic guidance, but with little practical guidance on how the components of the IT environment will be utilised (Chase, 2006). This is therefore not the solution for a diverse and complex environment such as the public sector.

Based on the literature review and the process followed in addressing principles 5.2 and 5.3 of the King III report in this research, a framework to govern IT in the public sector was recommended in Chapter 6. The public sector entity will first need to gain insight into the intrinsic nature of the entity as well as into the IT environment. Secondly, a combination of both a top-bottom and a bottom-top approach should be adopted as a framework, in order to ensure strategic direction as well as the effective utilisation of detailed IT components within the IT environment.

This research will add value to the public sector by proposing a framework towards governing IT in the public sector as no clear guidance exists. It could be used by the public sector to govern the IT environment.

GLOSSARY OF ABBREVIATIONS

- CIO - Chief information officer
- IT - Information technology
- LAN - Local area network
- SQL - Structured query language

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