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MODEL FOR IT GOVERNANCE TO IMPROVE INFORMATION TECHNOLOGY ALIGNMENT OF MULTI-CAMPUSES IN SOUTH AFRICAN INSTITUTIONS OF HIGHER LEARNING

by

Tembisa Grace Ngqondi

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by

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Abstract

Information Technology (IT) has emerged as an important issue for the public and private sectors. It has been initially identified as a vehicle in supporting business processes by speeding up the process of decision making and easy access of information as required for the competitive advantage of businesses. Organisations regarded IT as an enabler of their business processes. As IT has grown, its shape and definition have drastically changed from being an enabler of the business processes to become a central and strategic concern within the organisation that drives the business processes. The new IT landscape has made organisations completely dependant on IT for their decision making and effective functioning. The dependence on IT has created a need for unified and effective structures, standards and best practices that ensure the effective executiion of business processes using IT.

The establishment of IT Governance for institutions of higher learning has created the dual challenges of how IT Governance can work within the culture of inclusiveness and shared decision making while better aligning existing IT structures. These dual challenges vary from one university to another based on the culture of the specific university. This study therefore suggests possible ways that IT Governance can shape an institution of higher learning by strategically aligning the institution's IT strategy with the overall university strategy through the development of an IT Governance Model.

To come up with the said proposed model, qualitative research techniques such as document analysis, observations, interviews, a questionnaire and briefing sessions were used during the research process. The comparative analysis of the case studied was used to identify different IT Governance models adopted by other universities. Literature was reviewed to establish the emerging IT Governance practices established and implemented by different authors.

The result from this study is that an IT Governance model specific to WSU has been developed. This model can be used as guiding tool in establishing new IT Governance structures and also modify and improve the existing IT Governance structure of different institutions of higher learning. This model can further be used to guide the development of the institution IT Governance implementation architecture framework.

Key words: IT Governance, institution of higher learning, strategic alignment

Declaration

I, Tembisa Grace Ngqondi, hereby declare that:

The work contained in this dissertation is my own work.

All sources used or reffered have been documented and recognised.

This dissertation has not previously been submitted or partial fulfilment of the requirements for an equivalent or higher qualification at any other recognised educational institution.

Signature ………………………………………………

Date ……………………………………………….

Dedication

This study is dedicated to God Almighty who gave me strength and courage to pursue and compile this thesis. Above all I thank God for my parents who taught me the good way of life through their tough hard love at times and their guidance in handling life's challenges. My mom and my dad will always be my heroes.

Acknowledgements

The Thesis Layout Structure

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Acronyms

Acronym	Full Name
AI	Acquire and Implement
AU	African Union
CBD	Central Bussuness District
CHE	Council on Higher Education
CI	Community Interaction
CIT	Center for Information Technology
CMM	Capacity Maturity Model
CMMi	Capacity Maturity Midel Integrated
COBIT	Control Objectives for Information and Related Technology
COO	Chief Operations Officer
CvB	College van Bestuur (Executive Board)
DHET	Department of Higher Education and Training
DoE	Department of Education
DS	Deliver and Support
HE	Higher Education
HEI	Higher Education Institutions
HEQC	Higher Education Quality Committee
HOD	Head of Department
HPCV	High Performance Computing and Virsualisation
HR	Human Resources
ICF	Information Curators Forum
ICT	Information and Communication Technology
ICTC	Information and Communication Technology Committee
ICTO	Information and Communication Technology Oversee
IMC	Institutional Management Committee
IRP	Institution Research and Planning
ISACA	Information Systems Audit and Control Association
ISO	International Organisation for Standard
IT	Information Technology
ITAC	Information Technology Advisory Committee
ME	Monitor and Evaluate
NCHE	National Commission of Higher Education
NMD	Nelson Mandela Drive
NWG	National Working Group
PCMM	People Capacity Maturity Model
PMO	Programme Management Office
POs	Plan and Organise
RUG	Rijksuniversiteit Groningen (University of Groningen)
SEI	Software Engineering Institute
SIM	The Society for Information Mnagement
SRC	Students Representative Council
SU	University of Stellenbosch
UBS	Stellenbosch Business School
UWP	University Workstation
WSU	Walter Sisulu University

Chapter 1: Diagram Overview

A Model for Information Technology (IT) Governance to Improve IT Alignment of Multi-Campuses in South African Institutions of Higher Learning

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Chapter 1: Background and Research Orientation

1.1   Introduction

The objective of this research is to develop an IT Governance Model specific to Walter Sisulu University, but which can also be easily adopted by any other institution of higher learning which does not have such a model in place or which is thinking of improving its existing IT Governance. The structure of this model will be addressed in different phases so that its implementation is not overwhelming and fails to reach its goal. The phases will:

- Suggest the basic processes that the university can start with which are informed by the current state of the university, then further

- Include the developmental phase, which will address how the university can improve its processes as they continue developing their systems, and finally

- Define the future plan of improving and maintaining the model for the life time survival of the university's IT Governance.

The proposed recommendations of this model will be informed by the best national and international IT Governance practices which can be modified to suit the needs of a specific university.

1.2   Background and Orientation

Information Technology (IT) has emerged as an important issue for both the public and private sector. It has been initially identified as a vehicle for supporting business processes in speeding up the process of decision making, easy access of information as required by management and stakeholders, etc and for the competitive advantage of the businesses. Organisations regard IT as an enabler of their business processes. As IT has grown, its shape and definition have drastically changed from an enabler of business processes to becoming a central and strategic topic of the organisation that drives the business processes. The new IT landscape has made organisations completely dependent on IT for their decision making and effective functioning. The dependence on IT has created a need for unified and effective structures, standards and best practices that ensure effectiveness in executing business processes using IT.

IT standards and best practices are modified as IT advances to address the needs of the current IT age and are developed by different non-governmental bodies that have a common

interest in unifying the information technology standards and practices globally. There are recognised and accepted bodies that have undertaken the responsibility of developing standards and best practices including, but not limited to, the International Organisation for Standardisation (ISO), the King Committee on Cooperate Governance and the Information Systems Audit and Control Association (ISACA),

IT Governance is one of the issues undertaken by these bodies. According to De Haes and Van Grembergen (2008), the pervasive use of technology has created a critical dependency on IT that calls for a specific focus on IT Governance. IT Governance is defined as the leadership and organisational structures and processes ensuring that an organisation's IT sustains and extends the organisation's strategy and objectives (IT Governance Institute, 2003). However, when it is addressed it also considers other aspects of organisational governance because it is a component of the organisation corporate governance. The establishment of IT Governance for institutions of higher learning has created dual challenges of how IT Governance can work within a culture of inclusiveness and shared decision making while better aligning existing IT structures. These dual challenges vary from one university to another based on the culture of that specific university. However the organisational development theories defined in section 3.6.9 describe the best models of addressing and implementing cahneg for the organisation which is WSU for this study.

Besides the IT Governance issue, universities of higher learning in South Africa went through a major restructuring process during the merger process initiated by the government of the country whereby some universities and technikons were grouped according to their dermacation and merged to form one institution in 2002. The restructuring process created a significant governance challenge for most universities but specifically for those who were formely disadvantaged (Higher Education South Africa, 2010). This restructuring process created a scenario in which different IT systems within different universities hitherto operating independently had to be integrated into a single sytem; this resulted in challenges for the IT mandate for universities.

IT Governance is a leadership, organisational structure and process to ensure that IT sustains and extends an organisation's strategy and objectives; it therefore calls for an effective alignment of the business and IT strategies. For this study, the strategic allignment of IT systems has been identified as a good point of departure in establishing good IT Governance. This can improve and maintain effective alignment of IT and business strategies that lead to achieving university objectives and vision.

In this chapter the motivation for the research is outlined followed by the presentation of the research questions. In order to address the problem statement and the research questions, a chosen methodology for the research is then presented. Finally, the proposed outline for the final report is presented followed by an outline of the plan for the research.

1.3   Problem Statement

Earlier in this chapter, it was stated that the transformation landscape of higher education through mergers in South Africa has posed a challenge for the institutions of higher learning in managing the governance of the universities' activities including the administration of information technology infrastructures. Other challenges such as strategic decisions and the drawing up and implementation of policy documents, geographic distance of multi-campuses and the use of diverse IT systems from the legacy institutions have affected the integration and use of university processes at WSU. The constraints of using different IT systems have been assumed to be the main contributing factor in compromising the institutional mandate of research, teaching and learning.

A possible solution for the diversity of IT systems and the lack of integrated IT systems can be achieved when the institution possesses a sound IT Governance model. Kvavik (2004) indicates that IT Governance is integral to the success of strategic planning and alignment of institutions of higher learning. Hence this study proposes an IT Governance Model specific to WSU which can be applied to achieve successful strategic alignment at the university.

The problem statement addressed in this research is that there is no clear IT Governance Strategic Alignment policy addressing the efficacy aspect which manages the alignment of IT and business strategies at WSU.

While other IT Governance Models exist they may not be tailored to meet the specific needs of WSU as well as other institutions of higher learning established after the merger process in South Africa. The following research questions were derived for this research when developing the explained IT Governance model for WSU.

1.4   Research Question

This section presents the main research question and the sub-questions.

Main Research **Question***: How can a model for IT Governance improve the implementation of the alignment of business and IT strategies for Walter Sisulu University (WSU)?*

The sub-questions necessary to support the primary research question are:

Sub-question 1: How has IT Governance been approached in general?

Sub-question 2: How is IT Governance currently implemented at WSU?

Sub-question 3: How is IT Governance structured and implemented at benchmark academic institutions of higher learning in South Africa and internationally?

Sub-question 4: What are the components necessary to develop an IT Governance model specific to the multi-campus delivery sites of the institutions of higher learning?

1.5   Research Objectives

The main objective of this research is to establish a model that enhances the alignment of IT to the strategic objectives of an institution.

Findings of this research are expected to provide an opportunity to:

- Investigate literature on IT Governance's best practices and IT Governance in general

- Examine the general IT Governance and best practices that will be used as a base in developing a proposed model

- Investigate the validity and the extent to which IT Governance is currently utilised at WSU

- Investigate the IT Governance of established international and South African institutions of higher learning to identify how they manage their IT Governance for multi-campuses effectively, and confirm their strengths and gaps

- Build an augmented theory based on a comparative research of the SU and RUG for the benchmarking when developing a proposed IT Governance model for WSU since they have been identified as universities with good IT Governance structure

- Develop an IT Governance model with a specific focus on alignment for the purpose of improving service delivery of multi WSU campuses.

1.6   Significance of the Research

While some work on IT Governance has been accomplished, little has been done relative to the development of IT Governance for multi-campus or merged institutions of higher learning (Tolley, 2010; Yanosky & Caruso, 2008). Literature suggests that IT Governance is new and important for various sectors; however, its main focus has been in the private sector (Hoch & Payan, 2008). IT Governance is a concept for both public and private sectors, but the strategic approach used in defining IT Governance somehow differs because of the different nature of the

services they provide. Van Grembergen and De Haes (2004) argue that IT Governance developed in one organisation cannot be treated as a 'one-size-fits-all' approach for other organisations because it is developed based on a specific organisation's information technology infrastructure, business processes, and strategic alignment. This notion is also supported by Pirani and Salaway (2004) who state that it is impossible for different colleges and universities to have 'one-size-fits-all' approach to IT Governance because they are considerably diverse in terms of their institutional culture, size, complexity and other variables. However, benchmarking the proposed WSU model to top-rated international and South African universities by learning from their strengths and weaknesses is unique and will assist in building a new model specific to WSU, while simultaneously contributing to the body of knowledge on the topic.

Luftman's alignment maturity (2000) can be used as a roadmap to identify what can be undertaken next to close the gap between the current and the future maturity level of an organisation's IT alignment. Luftman's alignment maturity questionnaire further highlights that the level of alignment seems to be on the low side. This research is proposed because to the best of the researcher's knowledge, there is no known research that focuses on IT Governance strategic alignment for multi-campus institutions of higher learning in the South African context specifically for the merger of historically disadvantaged institutions. Having identified a shortage of research output on IT Governance in the public sector (specifically in the environment of multi-campuses resulting from the merger of particular institutions of higher learning), this research makes a methodological contribution to the Information Systems body of knowledge at various stages of the research process, namely:

- The data gathering approach which occurred in the diverse settings of the institutions of higher learning

- The synthesis of data through comparative research that contributed to the development of the IT Governance model specific to the multi-campus environment of the case research, and

- The development of the IT Governance model specific to multi-campuses of merged institutions of higher learning as proposed will be developed primarily for WSU after comparisons with two other universities.

1.7   Literature Review

A literature review will be completed in two chapters of the thesis, namely Chapter 2 and Chapter 3. Chapter 2 will focus on the role of Higher Education policies and the impact of the

restructuring of Higher Education sector in South Africa. Chapter 3 will review literature pertaining to IT Governance and IT Governance best practices which will be used in guiding the process of developing the WSU IT Governance Model.

The literature review is conducted through an examination of the in-depth works captured of different researchers and authors in the form of journals, articles, reports, books, manuals and e-documents. The developed model, namely the WSU IT Governance Model, will then be presented based on literature elements.

1.8   Research Design and Methodology

The research methodology will be conducted in different phases through case studies. The first phase will be focusing on an extensive literature review which enlightened the researcher concerning the governance structure and restructuring of the institutions of higher learning environment. The literature on IT Governance maturity described by different authors also assisted the researcher in conceptualising the basic IT Governance principles that will be contributing towards the development of the proposed model. The second phase will be descriptive in nature, emphasising the gathering of data in an effort to understand university IT Governance and other related IT Governance components through document analysis and briefing sessions. The briefing sessions will provide a holistic picture of university's organisational structure and describe how IT Governance is positioned which will define the real life context of IT Governance in the university.

The second phase will embrace the explanatory aspects of the study where the purposive sample will be identified from an understanding of the real life context of the university. Subsequently data will be collected through interviews and observations. The third phase will map the findings of the IT Governance using best IT Governance practices to test its credibility, viability and compliance with national and international standards.

A qualitative research approach using multiple-cases such as Stellenbosch University and RUG will be used in obtaing insight from their IT Governance structure for the purpose of using them as a benchmark that will contribute to the development of the proposed WSU IT Governance model. Since this study will be interpreting complex IT Governance scenarios of different universities and literature an intepretivism philosophy will be used for this study. The study will use different approaches of data analysis such as within-cases, cross–cases and holistic-case analysis where by triangulation will also be used during data collection and analysis. The research process of this study is outlined in Figure 4.6.

1.9   Assumptions

In the event that the model is adopted as proposed, there will be improvement in different areas of the university. The realisation of IT as an organisational enabler in executing and achieving the university's objectives and mandate will be the key benefit to the institution. The realisation of IT as an institutional strategic vehicle in achieving the university's mandate will enable different key university stakeholders, from the executive management to the operational staff, to identify their key role(s) in the IT Governance structure. The realisation of different roles by the university stakeholders can improve communication, effective and collaborative decision making, effective use and sharing of IT resources, and achieve the university's mission and vision of having a conducive and vibrant environment in which research, teaching and learning take place.

It is also expected that the proposed WSU IT Governance model may be used as a baseline for other universities both (existing and new).

1.10   Delimitation of the Research

The purpose of this research is to develop an IT Governance model with specific focus on strategic alignment which will serve as a tool for Walter Sisulu University (WSU), which was established following the merger of institutions of higher learning in South Africa, specifically as it is a historically disadvantaged institution of higher learning. It is envisaged that this model can be used by other institutions of higher learning, as the model scope will be derived from the context of multi-campuses and historically disadvantaged institutions of higher learning similar to WSU. The geographic distance of the investigated institutions will prevent the researcher from conducting observations on site. Instead, osbervation through analysing and viewing areas of interest will be undertaken during a short visit to the university; hence, data will be gathered mainly through interviews, briefing sessions,document analysis and partly through observation.

The model could be ineffective if:

- IT is not considered a strategic item of the university which its budget forms part of the overall university budget
- The stakeholders do not play their key roles in executing the model, or
- The IT Plan proposed in the model is not integrated into the mission and vision of the university.

1.11 Consideration of Ethics

In any research it is important that the researcher conducts research in an honest manner (Olivier, 2009). According to the Social Research Association (2003), the integrity and conduct of social research is dependent upon the collective behaviour of individual researchers and the consequences of their actions in society at large. In general, researchers have an obligation to conform to the ethical standards of the society in which they conduct their work.

Olivier (2009) and the Social Research Association (2003) indicate that the consideration of ethics is important to all research especialy when the research involves people. The highest standards of academic conduct and integrity should be applied by a researcher and accepted by the participants. I, therefore, wish to declare my commitment to the pursuit of truth and knowledge and to the right to dignity and respect of the organisations and individuals who will participate in and contribute to this research

The aims and objectives of this research were communicated to all the participants and the data collection procedure was forwarded to the participants prior to the process of data collection. The research engaged participants from diverse areas of the institution, such as the executive management of WSU, a sample of academic and support directors, and the Director of information and communication technology. For other institutions, information technology directors or managers responsible for IT Governance strategic plannning were interviewed. The integrity of data and subsequent findings will be secured through the deployment of appropriate ratification techniques. Obtaining informed consent from all participants and anonymity will be guaranteed. Data will be kept at WSU by the researcher after completion of the research for a period of two years. All data of a personal nature will be treated with confidentiality (see Annexure A-2).

1.12 Outline of the Proposed Chapters

The thesis is structured as follows: Chapter 1 introduces the background to the research and the research problem. The objectives of the research are spelt out and the significance of the research stated. In Chapters 2 and 3 literature relevant to this research is investigated. Chapter 2 describes the background to the merger of multi-campuses and further highlights its role in the institutions of higher learning. Chapter 3 focuses on IT Governance in general, strategic alignment and best practices and further describes the concepts and terminology of IT Governance. Chapter 4 presents the research methodology by discussing the research process used in this research. Chapter 5 presents the findings of the case studies leading to Chapter 6 which presents the comparative analysis of the three cases and the proposed IT Governance

Model for WSU. Chapter 7 presents the evaluation of the proposed model which leads to Chapter 8 that presents the study achievements, recommendations, conclusion and the potential implications for theory as well as limitations.

1.13 Research Strategy and Outcomes

This section explains how the research questions and objectives were addressed in the thesis.

Table 1.1: Summary of how Research Questions and Objectives were addressed
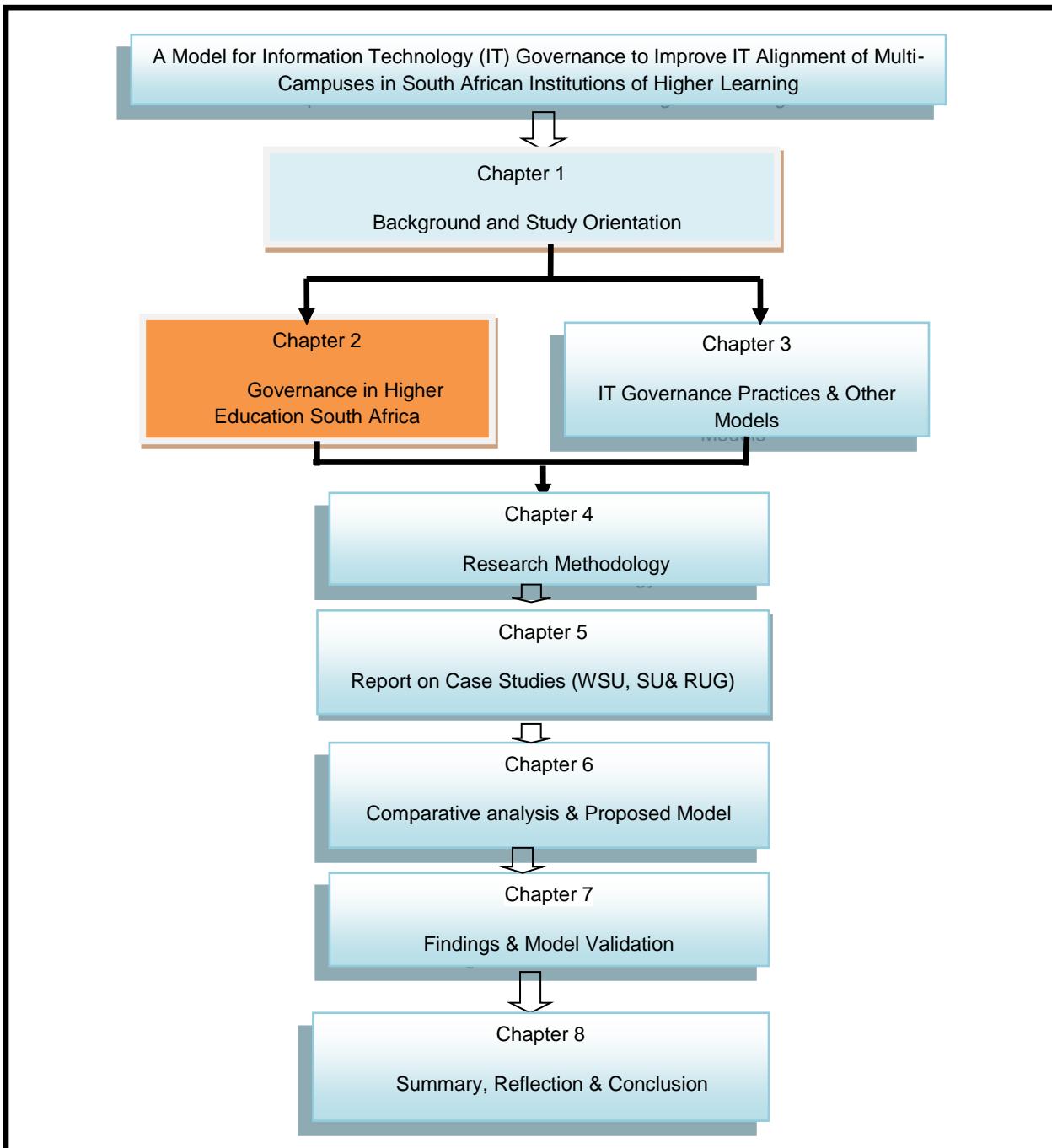
Research Objectives	Research Questions	Chapter or Section addressing the research objectives and questions
Objective 1: Investigate literature on IT Governance's best practices and IT Governance in general.	How has IT Governance been approached in general?	Chapter 3 of the study describeds the generic approach to IT Governance and further defines best IT Governance standards / practices which support objectives 1 and 2 of the study and further answer research question 1.
Objective 2: Examine the general IT Governance and best practices that will be used as a base in developing a proposed model.		
Objective 3: Investigate the validity and the extent to which IT Governance is currently utilised at WSU.	How is IT Governance currently implemented at WSU?	Chapter 2, section 2.4 and Chapter 5, section 5.2 describes state of IT Governance at WSU which supports objective 3 of the study.
Objective 4: Investigate the IT Governance of established international and South African institutions of higher learning to identify how they manage their IT Governance for multi-campuses effectively, and confirm their strengths and gaps.	How is IT Governance structured and implemented at benchmark academic institutions of higher learning in South Africa and Internationally?	Chapter 5, sections 5.3 and 5.4, describe the structure of IT Governance in the benchmarked institutions of higher Learning by explaining how IT Governance is structured to effectively support the mandate of the university.
Objective 5: Build an augmented theory based on a comparative research of the institutions studied.	What are the components necessary to develop an IT Governance model specific to the multi-campus delivery sites of the institution of higher learning?	Chapters 3, 5 and 6 describe the components that effectively contributed to developing IT Governance specific to WSU. This is further supported in Chapter 7 whereby the evaluation of the proposed model is explained. The recommendations outline in Chapter 8 further emphasise the relevance of the components of
Objective 6: Develop an IT Governance model with a specific focus on alignment for the purpose of improving service delivery of multiple WSU campuses.		

Research Objectives	Research Questions	Chapter or Section addressing the research objectives and questions
		the proposed WSU IT Governance Model.

1.14 Chapter Conclusion

This chapter has introduced the thesis overview and what the reader can expect in the chapters to follow, that is it provides an overall introduction to other chapters. The research benefits, limitations and assumptions about the study and the consideration of ethics were explained. A summary of how the study objectives and questions were answered is illustrated in Table 1.1.

Chapter 2: Diagram Overview

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Chapter 2: Governance in Higher Education

2.1   Introduction

The focus of this research is on IT Governance strategic alignment. However, it has been emphasised that IT Governance is effective when it is defined in the context of the concerned organisational governance (Van Grembergen & De Haes, 2004). In 1997 the Department of Education now known as the Department of Higher Education) in South Africa introduced a standard Institutional Governance Structure for institutions of higher learning, which was gazetted in the country's Higher Education ACT 101 of 1997 and further amended in 2001. In Chapter 4, sections 26 – 38 of the Higher Education Act 101 of 1997, governance in higher education refers to the means by which higher educational institutions are formally organised and managed (Asmal, 2002). This means that the structure of governance also defines the level of decision-making within the institution. The institutions of higher learning in South Africa have a standardised institutional statute to guide the structure and management of the institution. The standardised statutes are valid to higher education in South Africa before and after the transformation of the institutions of higher learning due to the merger (Hall, Symes, & Luescher, 2004). Mergers were introduced for the purpose of the betterment of the institutions of higher learning, but it is envisaged that the process has posed challenges of different kinds including governance, leadership and management (Higher Education South Africa, 2010). The identified challenges are further defined by Higher Education South Africa (2010) as follows:

- Governance in higher education entails power and shared responsibilities among a variety of stakeholders and the challenge posed by this structure relates to the contestation of the different stakeholders compromising the level of accountability which compromises the level of implementing the institution mission.

- The main challenge of the institution leadership is to determine and lead institutional strategies for change, viability and excellence while committing to relevance to local and national needs.

- Challenges of management are the allocation and alignment of resources with the university's mission and ensuring these are utilised effectively and efficiently to support the institution's operations.

In summary, these challenges are all governance issues that cut across all areas of the institution, hence the significance of this research.

This chapter defines institution governance as documented in Act 101 of 1997 in order to propose an appropriate level where IT Governance can be introduced into the institution being studied. Furthermore, various merger components are defined in this Chapter. The literature captured assists in making informed decisions by identifying key factors relevant to the case research during the process of data collection and the development of the proposed model of IT Governance strategic alignment.

2.2   Institutional Governance Structure

The institutional governance structure is an overall governance which organises and manages the institution's activities. IT Governance is (or is supposed to be) a subset of institutional overall governance (Roets & Sewry, 2006). However, it is always difficult to refer to IT Governance without mentioning and understanding organisational governance; hence this section is vital for this research. The South African Institutional Governance Structure as documented in the Higher Education Act 101 of 1997 amended in 2001 (Asmal, 2002), consists of the structures outlined in Table 2.1. The functions of each structure are summarised in the table; however a full definition of each structure can be obtained from the Higher Education Act 101 of 1997 and Standard Institution Statute as amended by Government Gazette No. 21448, Government Notice No. 724 of May 2002.

Table 2.1: Summary of the South African Institutional Governance Structure

Institutional Governance Structure as in Higher Education ACT 101 of 1997	Functions of the Institutional Governance Structure
1. Chancellor	The titular head of the institution that confers all degrees and awards all diplomas and certificates in the name of the institution, and performs other functions as assigned by the council.
Structures and Offices:	
a. Council	The council governs the institution by:; • Making institutional rules • Establishing and determining the composition and functions of the council committee • Establishing, in consultation with the senate,

Institutional Governance Structure as in Higher Education ACT 101 of 1997	Functions of the Institutional Governance Structure
	joint committees of the council and senate to perform functions common to the council and senate, etc.
b. Senate	The senate is accountable to the council for all the teaching, research and academic functions of the institution and all other functions delegated or assigned to it by the council.
c. Principal	The principal is responsible for the management and administration of the institution.
d. Vice-principal	The vice-principal,with the rector's management team, is responsible for the day-to-day management of the institution.
e. Students' representative council (SRC)	The SRC represents the interests of the student community at various levels of the institution forum including council, other international and national institutional structures.
f. Other structures and offices as determined by the institutional statute	Other institutional structures/forums advise the council on issues affecting the institution in various aspects.
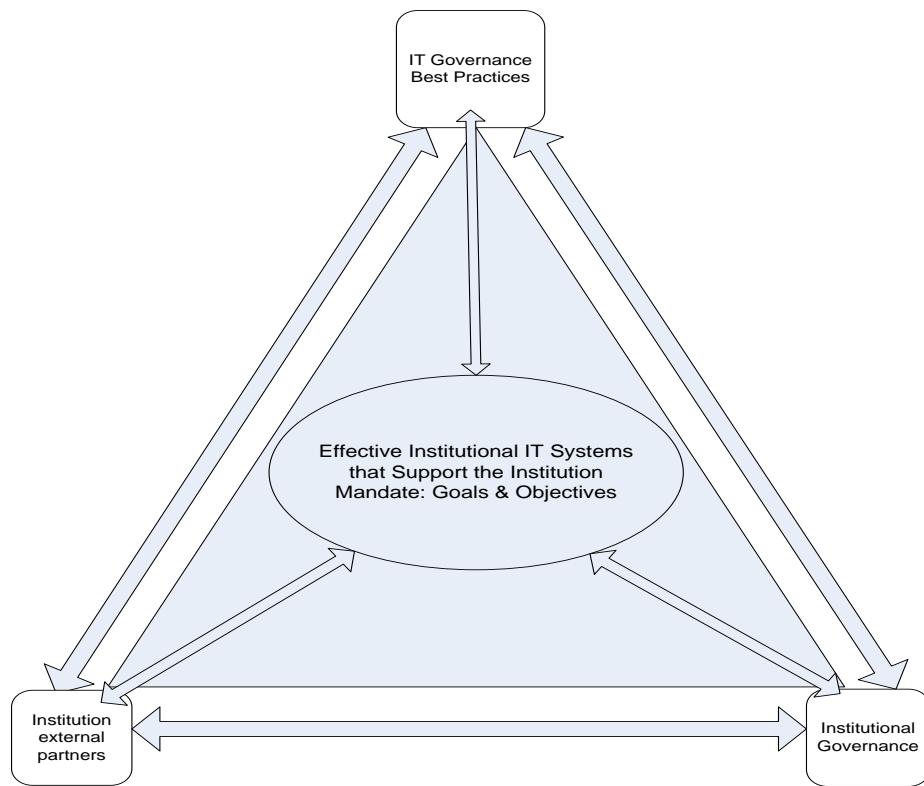
Source: (Asmal, 2002)

The institutional governance structure defined in Table 2.1 is just a standard guide provided by the Higher Education Act of the country, but each institution has a right to develop its own specific institutional statute without diverting from the proposed government standard institutional statute. The proposed institutional statute can be operational after it has been approved and gazetted as required by the Higher Education Act of the State.

The institutional governance structure describes the best level at which IT Governance of an institution should be addressed. Having observed the structure of the council, it has been

proposed to be the best structure where IT Governance can be addressed, because it consists of the institution's leadership that has the power to make rules and establish relevant committees and forums that can assist in fulfilling the institution mandate. Weil and Ross (2004); Van Grembergen and De Haes (2005) and the IT Governance Institute (2003), state that IT Governance is the responsibility of the board of directors and executive management. It is an integral part of enterprise governance and consists of leadership, organisational structures and processes that the organisation's IT sustains and extends the organisation's strategies and objectives. These authors confirm the relevance of the proposed structure to establishing IT Governance in any institution of higher learning.

In the process of identifying the best fit of IT Governance in the public institution of higher learning it is also important to take cognisance of other important components of organisational governance, that is, IT Governance and all external governance structures contributing to the institution's success. Figure 2.1 illustrates that institutional governance is one of the important pillars of establishing effective IT systems for the institution (Pirani and Salaway, 2004). It further highlights the direct relationship between the three pillars. IT Governance, institutional governance and institution partners directly contribute to the effective institutional IT systems by understanding their role and seeing where they link with one another to make an effective contribution to the institution's IT systems (Sethibe, Campbell, and McDonald, 2007).

Figure 2.1: Guide for the Effective Institutional IT Systems (Pirani & Salaway, 2004)

Effective IT Systems are central to success of the institution because the institutional academic and administrative activities are technologically driven (Pirani & Salaway, 2004 and Chin, Brown, & Hu, 2004); however, it is guided by the institution's mission and vision. As highlighted in Figure 2.2 transformation of the institutions of higher learning has posed challenges to institutional governance due to the diverse structures of the merging institutions. The following section discusses the merger as proposed by the higher education ministry and the merger background of the case research.

2.3   Restructuring of the Higher Education System

Restructuring of institutions of higher learning through mergers has been a general feature for the past 20 – 30 years in developed countries (Hall, Symes, & Luescher, 2004). However, the transformation of the institutions of higher learning in South Africa was introduced after the election of the democratic government in 1994 (Bengu, 1997). The Education White Paper 3, Notice 1196 of 1997 indicates that the transformation in higher education was proposed by President Nelson Mandela in 1995 after extensive investigation and consultation when the National Commission of Higher Education (NCHE) was established (Department of Education, 1997).

After the presidential recommendations on higher education, Prof Bengu, the then Minister of Education, dedicated the first two years to an extensive, participatory drive towards policy formulation that culminated in a report from the National Commission on Higher Education (NCHE) in 1996 (Cloete, 1998). Cloete (1998) further highlights that, following the commission report, the phase of converting it into a White Paper and a new Higher Education Act was publicised in 1997. There were a number of activities the Ministry of Education addressd in response to the White Paper 3: A Programme for the Transformation of Higher Education 1997. These activities include:

- The development of institutional three-year rolling plans began in 1998; these were developed in the context of the broad transformation agenda and policy goals identified in the White Paper (Ministry of Education, 2001).

- In late 1999 the Department of Education (DoE) requested that the Council on Higher Education (CHE) develop a new academic policy in consultation with key higher education stakeholders (Badat, 2001).

- During late January 2000, the Minister of Education requested the Council on Higher Education (CHE) to conduct an overarching exercise designed to put strategies into place to ensure that South Africa' higher education system was indeed on the road to the 21st century as defined by President N. Mandela (Council on Higher Education Size and Shape Task Team, 2000).

These activities were all recorded in the form of reports by the Department of Education and CHE sites (CHE Sites:www.che.ac.za). The purpose of this research is not to define the findings of each process but to highlight the events before the merger.

The report of the Council on Higher Education Size and Shape Task Team (2000), further highlights that the shape and size of the task team was welcomed by the Minister. Based on their findings the Minister declared that a national plan containing the Ministry's comprehensive proposals for the shape and size of the higher education system would be published. The Ministry further indicated that the national plan would be framed within the broad framework of government policy as outlined in Education White Paper 3: A Programme for the Transformation of Higher Education 1997 (Council on Higher Education Size and Shape Task Team, 2000).

The framework and mechanism for higher education transformation was documented in the National Plan for Higher Education in South Africa of 2001 in the press report of May 2000

(Council on Higher Education Size and Shape Task Team, 2000). However, the then Minister of Education Prof Kader Asmal (2001) realised the extent and complexity of the transformation exercise and decided to establish a National Working Group (NWG) that would advise the Minister on the restructuring of the institutional landscape as outlined in the National Plan for Higher Education (Ministry of Education, 2001).

- The investigation was undertaken by the NWG based on the national plan and all other relevant sources addressing transformation. However, there are five critical policy goals and strategic objectives that should be considered by any group working on transformation and restructuring of the hgher education systems were identified in the Nation Plan. The following bulleted list presents the policy goals and strategic objectives which were identified by the Ministry of Education (2001).

- Increase access and to produce graduates with the skills and competencies necessary to meet the human resource needs of the country.

- Promote equity of access and outcomes and to redress past inequalities through ensuring that student and staff profiles reflect the demographic composition of South African society.

- Ensure diversity in the institutional landscape of the higher education system through mission and programme differentiation to meet national and regional skills and knowledge needs.

- Build high-level research capacity, including sustaining current research strength, as well as to promote research linked to national development needs.

- Build new institutional identities and organisational forms through restructuring the institutional landscape of the higher education system, thus transcending the fragmentation, inequalities and inefficiencies of the apartheid past and to enable the establishment of South African institutions consistent with the vision and values of a non-racial, non-sexist and democratic society.

After the NWG had considered all the important information for their exercise they produced their report in the form of the recommendations, which were reported in two-fold as follows (Ministry of Education, 2002):

- The first recommendation related to a number of general issues which were common to all regions.

- The second proposal was the consolidation of higher education on a regional basis through establishing new institutional and organisational forms, including a reduction in the number of education institutions from 36 to 21 through mergers.

After a period of consultation and lobbying based on NWG recommendations between the Minister and the institutions, the Ministry's response to the NWG recommendations was taken to Cabinet at the end of May 2002 and subsequently set out in the Government Gazette 10 for public comments in June 2002 (CHE, 2004).

The recommendations of the NWG regarding the number of institutions that should merge were reviewed after receiving the results of the consultation from the institutions and stakeholders. The restructuring in Higher Education resulted in the institutions outlined in Table 2.2 below (Higher Education South Africa, 2008 & CHE 2004).

Table 2.2: The New Institutional Landscape of South African Public Higher Education (CHE, 2004)
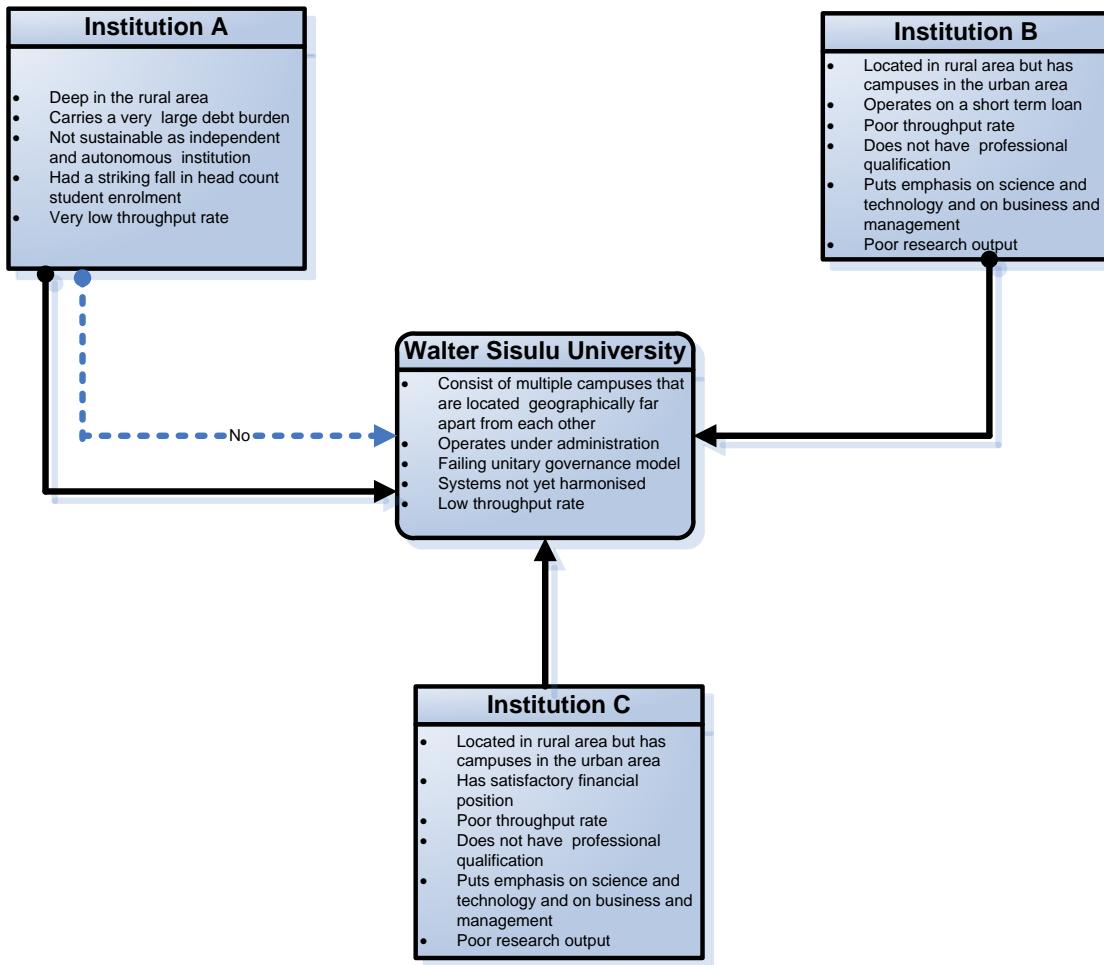
Institutional Type		Institutions
Universities	8 Separate & Incorporated Universities	University of Cape Town (UCT)
		University of Fort Hare (UFH) + Rhodes University East London
		University of the Free State (UFS) + Vista University (Bloemfontein) + University of the North (Qwa-Qwa)
		University of the Pretoria (UP) + Vista University (Mamelodi)
		Rhodes University
		University of Stellenbosch (SU)
		University of the Western Cape + University of Stellenbosch Dental School
		University of the Witwatersrand (WITS)
	Merged Universities	University of Durban Westville (UDW) + University of Natal to become University of KwaZulu Natal
		University of the North + Medical School of South Africa (MEDUNSA) to become University of Limpopo
		Potchefstroom University of Christian Higher Education (PUCHE) + University of North West (UNW + Vista University (Infrastructure & Facilities of Sebokeng) to become North West University

Institutional Type		Institutions
Universities of Technology	Separate and Incorporated	Technikon Free State (TFS) + Vista University (Welkom) to become Central University of Technology
		Vaal Triangle Technikon + Vista University (Infrastructure & Facilities of Sebokeng) to become Vaal University of Technology
	Merged (Technikons) Universities of Technology	Cape Technikon + Peninsula Technikon to become Cape Peninsula University of Technology
		Durban Institute of Technology (DIT) + Mangosuthu Technikon + Infrastructure Facilities of Umlazi campus of the University of Zululand to becometo become Durban University of Technology (DUT)
		Technikon Pretoria (TP) + Technikon North Gauteng to become to become Tshwane University of Technology
Comprehensives	2 Separate Comprehensives	University of Venda to becometo become University of Venda for Science and Technology
		University of Zululand
	4 Merged Comprehensives	Rand Afrikaans University + Vista University (East Rand and Soweto) to becometo become University of Johannesburg (UJ)
		University of Port Elizabeth (UPE) + Port Elizabeth Technikon (PET) + Vista University Port Elizabeth to becometo become Nelson Mandela Metropolitan University (NMMU)
		University of South Africa (UNISA) + Technikon of South Africa (TSA) + Vista University Distance Education Centre (VUDEC) to becometo become University of South Africa
		Border Technikon (BT) + Eastern Cape Technikon (ECT) + University of Transkei (UNITRA) to becometo become Walter Sisulu University (WSU)
National Institutes		Mpumalanga Institute for Higher Education
		Northern Cape Institute for Higher Education

Table 2.2 outlines the number of institutions resulting from the merger after the NWG recommendations were reviewed; however, the initial recommendations of the merger are captured in the NWG report for further information. The research will focus on the merger of WSU which is the case under consideration in this research. The case investigated, as outlined in Table 2.2 above, was the result of the merger of the two former technikons and one university in the Eastern Cape Province, namely Border Technikon and the Eastern Cape Technikon and the University of the Transkei.

2.4   Merger of the Case Research: Walter Sisulu University (WSU)

The merger of WSU is unique in the context the mergers of the institutions of higher learning in South Africa because it is the only merger of a historically disadvantaged university and two historically disadvantaged technikons. The purpose of the Ministry of Education for the restructuring of higher education systems of institution of higher learnig did not fit this merger because the characteristics of the merged institutions did not redress the problems of apartheid (Jack, 2010). The findings of the independent assessor indicated that WSU continue to function largely as quasi-autonomous entity holding on to its pre-merger management practices and systems; however, as such, these findings reflected that WSU was not yet a comprehensive university thus demonstrating that it did not redress the problems of the past (Ncayiyana, 2011). Before the merger of WSU the NWG report suggested that institution A should be closed down because it was not fit to be part of any merger due to its financial burden and poor administration and governance, and the merger was suggested instead for institutions B and C, though institution B was also operating on a short loan arrangement. Despite the recommendations of the NWG, WSU was established from the merger of three institutions (Ministry of Education, 2002). The background of these institutions as described in the NWG report further emphasises the uniqueness of this merger.

Institution A

- Deep in the rural area
- Carries a very large debt burden
- Not sustainable as independent and autonomous institution
- Had a striking fall in head count student enrolment
- Very low throughput rate

Institution B

- Located in rural area but has campuses in the urban area
- Operates on a short term loan
- Poor throughput rate
- Does not have professional qualification
- Puts emphasis on science and technology and on business and management
- Poor research output

Walter Sisulu University

- Consist of multiple campuses that are located geographically far apart from each other
- Operates under administration
- Failing unitary governance model
- Systems not yet harmonised
- Low throughput rate

No

Institution C

- Located in rural area but has campuses in the urban area
- Has satisfactory financial position
- Poor throughput rate
- Does not have professional qualification
- Puts emphasis on science and technology and on business and management
- Poor research output

Figure 2.2: Findings of WSU before Merger and after Merger (Ministry of Education, 2001; Ncayiyana, 2011)

Figure 2.2 above demonstrates the features of the legacy institutions before the merger as captured in the NWG report of 2002 (Ministry of Education, 2002), and further reports on the characteristics of the merged institution as captured in the Government Gazette 2011, which was consolidated by an independent assessor (Ncayiyana, 2011). As highlighted in this document, the NWG suggested a complete termination of institution A programmes except for the School of Health and Sciences programmes. It was recommended that the medical school programmes should be moved to the University of Fort Hare. The dotted line from institution A to WSU suggests that institution A was not supposed to be part of the WSU merger. The solid line indicates that it eventually ended up merging with the other two institutions. Institutions B and C were both recommended to merge together as demonstrated by one solid line pointing towards WSU. As highlighted above, WSU became a new institution after the merger. The merger of this institution is unique because it was established from the union of three

institutions, which were identified as poor in almost every important aspect that defined the viable and autonomous characteristics of an institution of higher learning. The features of each institution as highlighted in Figure 2.2 support this statement.

The weaknesses of the legacy of these institutions were carried over to the new institution, which resulted in an institution that had poor systems which were even worse than the legacy institutions before merger; hence it ended up being put under administration (Ncayiyana, 2011). An institution put under administration is an institution whose governance or management is performed by an external person appointed by the Minister of Education when a financial audit reveals financial or other maladministration of the institution (Asmal, 2002). There are various valid reasons for an institution to fail, for example, if it is not fully supported financially according to the management of the institution funding request. The independent assessor's report supports this view by highlighting that:
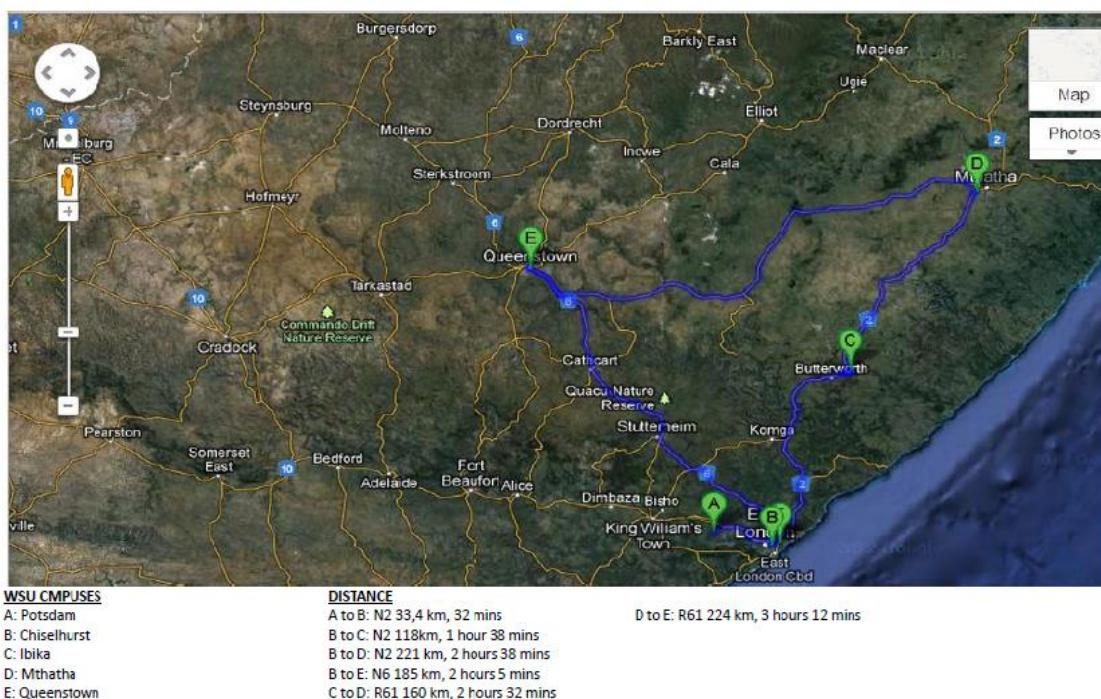
- The merger of WSU was unique and unlike any other merger, because it brought three historically disadvantaged institutions, with long histories of conflict of their own and significant budgetary and infrastructure backlogs together (Ncayiyana, 2011 and Jack, 2010),

- Dispersal over huge distances in one of the poorest regions in the country ensured that the university would always attract students too poor to afford tuition fees

- The dedicated funding for the merger was woefully inadequate, and ensured that the institution would start off from a vulnerable position

- WSU had submitted a merger budget of R1.2 billion, but was granted only R400 million over 3 years which was one third of the proposed budget.

The challenges highlighted in the independent assessor's report had a negative impact on overall institutional governance; this therefore also had an impact on acquiring and obtaining proper IT systems and other key operational systems. The independent assessor's report, as documented in the Government Gazette 2011, indicated that the institution's governance had a problem with various operations systems and processes (Ncayiyana, 2011):

- Finance, where there was a lack of internal control systems such as financial planning, budgeting, financial management and student financial aid

- Human Resources (HR) which lacked internal controls, HR planning and management

- Governance, where the Council and committees did not function properly, with poor monitoring, evaluation and reporting systems

- Information Technology Unit, with an improper infrastructure that functioned ineffectively and inefficiently

- Academic Enterprise, which did not support academic structures for teaching and learning and yielded poor academic quality

- Students without proper functioning structures and poor student affairs governance.

The challenges and implications of the institution's situation as captured in the assessor's report suggests a further research topic. WSU consists of five campuses or delivery sites and one teaching site geographically dispersed as indicated by letters A – E in Figure 3.3 (Google Maps).

WSU CMPUSES	DISTANCE	
A: Potsdam	A to B: N2 33,4 km, 32 mins	D to E: R61 224 km, 3 hours 12 mins
B: Chiselhurst	B to C: N2 118km, 1 hour 38 mins	
C: Ibika	B to D: N2 221 km, 2 hours 38 mins	
D: Mthatha	B to E: N6 185 km, 2 hours 5 mins	
E: Queenstown	C to D: R61 160 km, 2 hours 32 mins	
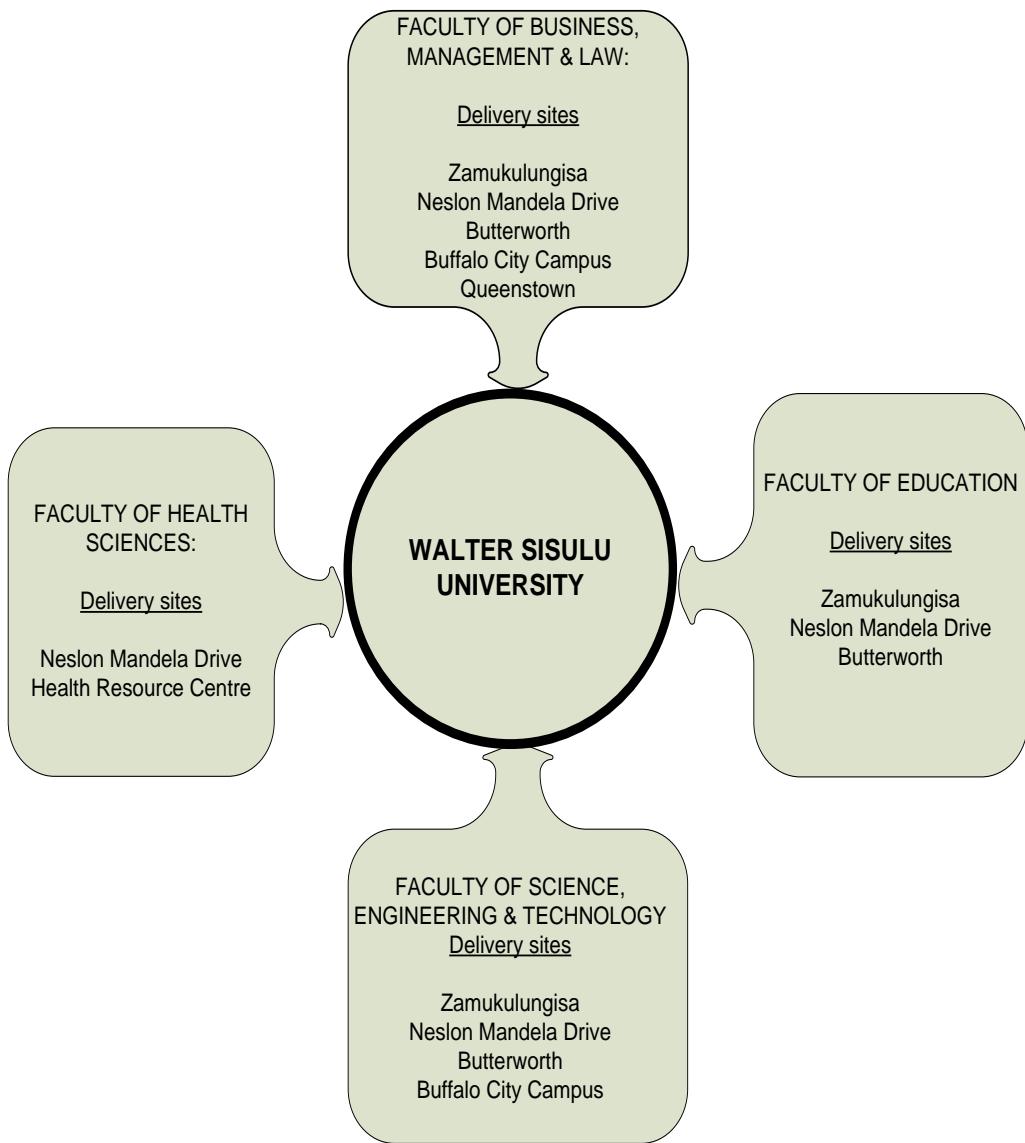
Figure 2.3: Geographical Illustration of WSU Campuses (Google Maps)

WSU also consists of four faculties; almost each faculty has departments and similar programmes across different campuses. The fact that the institution had multiple delivery sites and similar programmes duplicated in different delivery sites posed a challenge for IT systems, and therefore it was proposed that a comprehensive IT Governance structure should be established.

An institution with such a complex structure as WSU's will have an IT system that fails to deliver effectively if it does not have standardised IT Governance in place. The challenges of ineffective IT systems at WSU have been identified by the researcher and are further confirmed by the external assessor's report as captured in the Government Gazette No. 34641 (Ncayiyana, 2011).

2.5 WSU Campuses and Faculties

Teaching and learning activities for different faculties are spread across different campuses. Figure 2.4 below outlines the relational structure of faculties and campus or delivery sites. The repetition of faculties over different delivery sites has resulted in the duplication of some programmes. Due to the merger, the curriculum for the programmes had to be revised for the purpose of harmonisation of programmes across campuses. The integration of academic, operational and administrative activities across delivery sites was also integrated and this resulted in the need for an IT system which could support these activities. Hence, Figure 2.4 illustrates how the faculties are placed at different delivery sites.

Figure 2.4: Representation of Faculties in different at Walter Sisulu University (Ncayiyana, 2011)

- Nelson Mandela Drive (NMD) campus is the main campus with the executive management of the institution permanently stationed there. This campus is located in Mthatha, far from all the other campuses. The distance between satellite campuses and the main campus and amongst various delivery sites varies as indicated in Figure 2.3. The effective administration and functioning of these various campuses depends soley on an effective and comprehensive IT system infrastructure. Most meetings concerning institutional operational activities are held in NMD, which is not located centrally to any of the other campuses. This further emphasises the importance of IT Governance for this scenario because one of the

functions of IT Governance is to introduce a strategy of reducing and improving organisational costs in various aspects and further improve service delivery within a reasonable time. The strategy of reducing cost and introducing effective IT systems for the institution applies to all faculties and delivery sites at WSU.

- The Zamukulungisa teaching site in Mthatha is 10 km away from the main campus, but 185 km and 255 km away from other campuses. It offers programmes mainly from the Faculty of Business and Management and Faculty of Education. Most of the programmes offered at this site are also offered at the Butterworth campus.

- The Butterworth campus is located 130 km from the main campus. It offers programmes mainly from the Faculty of Business and Management, Faculty of Science, Engineering and Technology and Faculty of Education. Most of the programmes offered at this site are also offered on other campuses and the distance amongst satellite campuses varies as highlighted in Figure 2.3.

- The Buffalo City campus in the East London CBD is located 300 km from the main campus. It offers programmes mainly from the Faculty of Business and Management and Faculty of Science, Engineering and Technology. Most of the programmes offered at this site are also offered at other campuses and the distance amongst satellite campuses varies from, 30–130 km.

- The Queenstown campus at Whittlesea is located 300 km from the main campus. It offers programmes mainly from the Faculty of Business and Management. Most of the programmes offered at this site are also offered at other campuses and the distance amongst satellite campuses varies from 190–300 km..

This therefore emphasises the importance of having an IT Governance model because IT systems are the vehicle for teaching and learning in a harmonised environment. Hence, the setup of multiple delivery sites needs a proper IT infrastructure to fulfil the needs of research, teaching and learning. Effective Information Technology infrastructure is built on the best IT practices through IT Governance practices. The merger of universities was effected under the banner of the then Department of Education (DoE), which was led by the relevant Minister during that time. However, in 2009 the structure and responsibilities of the DoE were split into two departments, the Department of Higher Education and Training (DHET) and the Department of Basic Education under two new ministers, Dr. B. Nzimande for DHET and Angie Motshekga for Basic Education. Since the establishment of the DHET in 2009, attempts were made to
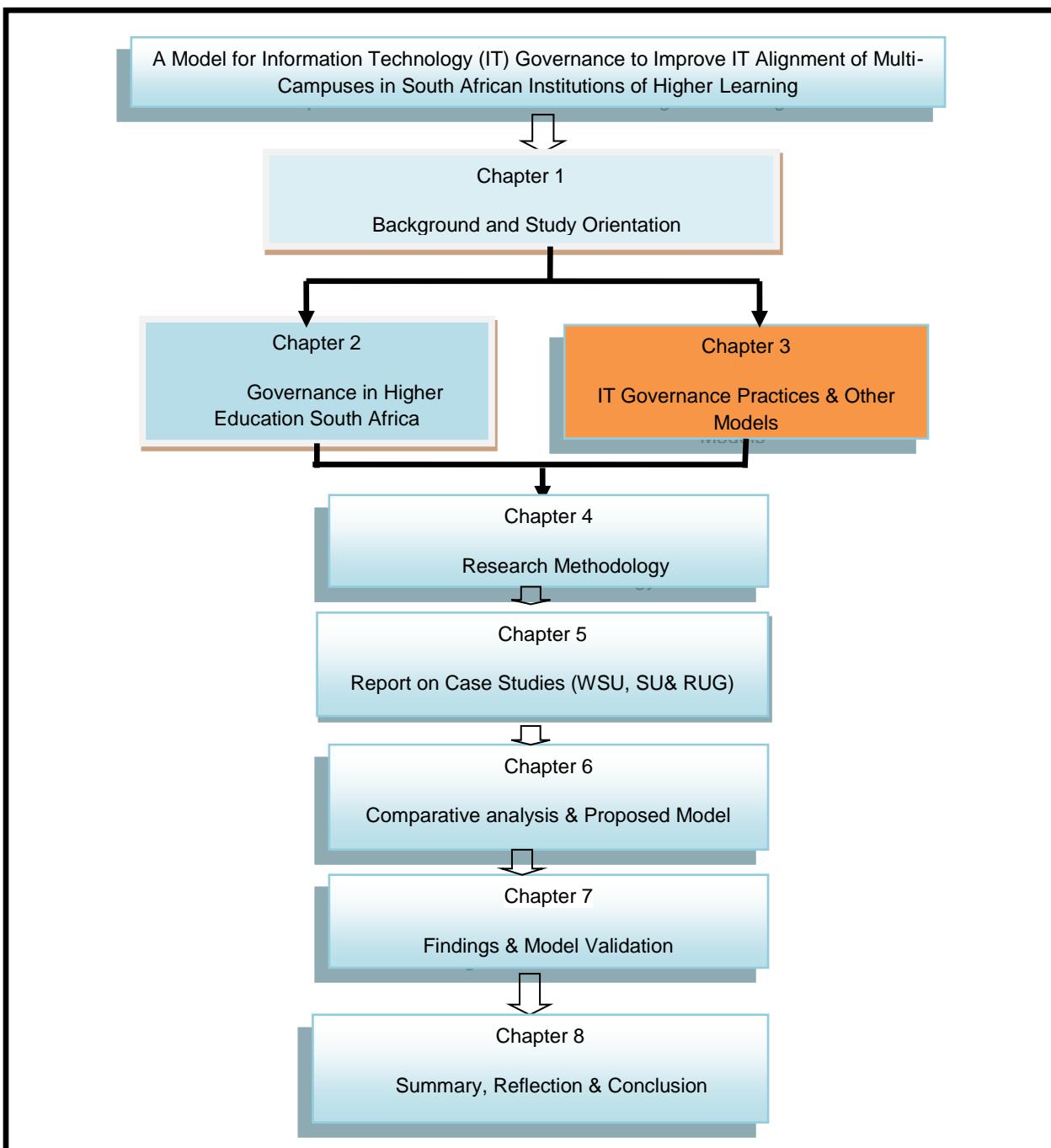
salvage three universities challenged by the lack of effective institutional governance by appointing an independent administrator to take over the governance of the university (Jack, 2010). WSU was one of the three universities put under administration. In the case of WSU the administrator was appointed for the purpose of monitoring the system of the university and restoring its governance of the university as per the recommendations of the assessor's report compiled by Ncayiyana (2011) and the specific terms of reference as captured in the Government Gazette No. 3418 of 2011. The administrator's terms of reference as captured in the Government Gazette promised to positively contribute to the governance of the institution of higher learning, enabling the university to acquire relevant structures and resources including IT infrastructure that would support and effectively execute the IT Governance Model proposed in this research for WSU.

The new DHET structure also promised to contribute effectively towards the development of a good governance model for the universities because the proposed comprehensive analysis system and reporting mechanisms would provide an early warning to the system threats and use protective measures before a situation became difficult to correct (Department of Higher Education and Training, 2010).

2.6   Conclusion

The Institutional Governance Structures of the institutions of higher learning were briefly described in this chapter to gain an insight into how universities are governed. The purpose of the merger of the institutions of higher education in South Africa and the process of the restructuring of higher education systems was further described to highlight changes in the education landscape and also further described how these changes have positively and negatively affected some universities. The establishment of the university investigated in this research and the factors that contributed to its establishment were demonstrated in order to gain an understanding of the background and current shape of the institution before developing a proposed IT Governance which is relevant and specific to the context of the institution. The institutional background described in this chapter emphasises the need to investigate and develop an IT Governance framework specific to the scenario of WSU. However, in the process of identifying and developing such a framework it is imperative to understand the best IT Governance practices and standards that will guide and inform the development of the proposed framework for WSU. The best IT Governance practices and other models are described in Chapter 3.

Chapter 3: Diagram Overview

A Model for Information Technology (IT) Governance to Improve IT Alignment of Multi-Campuses in South African Institutions of Higher Learning

Chapter 1

Background and Study Orientation

Chapter 2

Governance in Higher Education South Africa

Chapter 3

IT Governance Practices & Other Models

Chapter 4

Research Methodology

Chapter 5

Report on Case Studies (WSU, SU& RUG)

Chapter 6

Comparative analysis & Proposed Model

Chapter 7

Findings & Model Validation

Chapter 8

Summary, Reflection & Conclusion

Chapter 3: IT Governance Practices and Relevant Models

3.1 Introduction

Information Technology Governance (IT Governance) is a concept that has become an important issue in the field of Information Technology (De Haes & Van Grembergen, 2008). The pervasive use of technology has created a critical dependency on IT that calls for a specific focus on IT Governance (Van Grembergen and De Haes, 2005). IT Governance is defined as the leadership and organisational structures and processes ensuring that an organisation's IT sustains and extends its strategy and objectives (IT Governance Institute, 2003).

Krueger (2009) indicates that IT Governance has received substantial coverage in professional literature, which has captured the attention of leadership in colleges and universities; yet many institutions still strugle with the dual challenges of how to effectively work within the academic culture of inclusiveness and shared decision making while better aligning the existing IT strucure of the institution. Higher Education South Africa (2010) has identified governance and leadership as a critical challenge for the multi-campuses of academic institutions of higher learning after the merger. According to Higher Education South Africa (2010) , IT Governance is therefore identified as:

- An organisation strategic concept

- A leadership responsibility

- A tool to effectively drive and achieve organisational goals and objectives

- A tool to manage and maintain organisational IT activities.

The role of IT Governance supports the focus of this research; hence this chapter is more relevant to this research because it addresses the structure of IT Governance within the orgaisation by:

- Defining IT Governance
- Explaining the importance of acquiring IT Governance in the organisation
- Describing IT Governance domains
- Defining the relationship between Enterprise Governance and IT Governance
- Describing the best IT Governance Practices and further identifying those that will be used in the research

- Defining the importance of linking IT strategies with organisational strategies: Strategic Alignment.

3.2 What is IT Governance?

The concept of IT and IT Governance is not limited to a specific type of business, but has penetrated businesses of almost all kinds, ranging from small to large enterprises in both the public and private domains. According to Sethibe, Campbell and McDonald (2007), IT Governance is a public and private sector issue though its focus has been more on the private sector. IT Governance is a broad concept, which is defined by various authors based on their specific areas of interest. The researcher has based this study mainly on the definition following three IT Governance definitions since each definition has something which clearly defines IT Governance in the context of this study

- *IT Governance is the responsibility of the board of directors and executive management. It is an integral part of enterprise governance and consists of leadership, organisational structures and processes that sustains and extends the organisation's strategies and objectives* (IT Governance Institute, 2003)

- IT Governance sustains and extends the organisation's strategy and objectives through the active involvent of the organisation starting from the leadership and organisational structures, processes and relational mechanisms (Van Grembergen & De Haes, 2005)

- IT Governance is the decision rights and accountability framework for encouraging desirable behaviour in the use of IT. There are five IT-related decision areas in every organisation and these decisions are connected (Weil and Ross, 2004).

Table 3.1: Framework for the key IT Governance Decisions (Weil & Ross, 2004)

IT Principles Decision		
High-level statements about how IT is used in the business		
(How can IT create a business value?)		
IT Architecture Decision Organisation logic for data, application, and infrastructure captured in a set of policies, relationships, and technical choices to achieve desired business and technical standardisation and integration. (What technical guidelines and standards can be used?)	**IT Infrastructure Decision** Centrally coordinates shared IT services that provide the foundation for the enterprise's IT capacity. (How can the organisation build the shared services?)	**IT Investment and Prioritisation Decision** Decision about how much and where to invest in IT, including project approvals and justification technique. (How much and where can the organisation invest?)
	Business Applications Needs Specifying the business need for purchased or internally developed IT application. (What applications can be used?)	

IT decision domains cannot be effective if they are discussed without knowing the organisation's objectives. Hence, authors such as Ridley (2006) and Weil and Ross, (2004) argue that IT Governance processes and structures are there to ensure that an organisation's IT sustains and extends the organisational strategies and objectives. This can be achieved when the organisation understands the importance of IT Governance to their organisation. The importance of IT Governance is defined in the following section.

3.3 Importance of IT Governance

As highlighted earlier, IT has become an integral part of every organisation; hence IT Governance has also become an important issue to guide the organisation's implementation of IT. Brisebois and Oman (2007) point out that IT has become a major enabler tool in most business transformation initiatives. How IT is being used has a very important impact on whether the organisation achieves its vision, mission or strategic goals (Brisebois and Oman, 2007). The National Computer Centre further indicates that IT Governance is important because it covers the culture, organisation, policies and practices that provide oversight and transparency; and is part of the wider Corporate Governance with its specific focus.

In the environment of higher education, IT is a fundamental component of basically every aspect of a university's mission because it addresses culture, policies etc. as defined by Brisebois and Oman (2007). University activities such as teaching, learning, research, services and administration all rely on IT and use it intensively. The effectiveness of the university IT in achieving its goal is informed by effective IT Governance structures that:

- Build and provide trust across different units of the university;

- Provide better delivery of the university solutions;

- Synchronise IT strategy with the overall university strategy and

- Encourage desirable behaviour in the use of IT.

Different authors such as Ridley (2008), Sweden (2008) and Khan (2006) further indicate that IT Governance finds the balance and direction that satisfies organisational needs and obligations to ensure innovation and effectiveness of an organisation's departments. This therefore confirms that IT Governance is important for different types of organisations that rely on IT for their daily operations because IT Governance introduces a transparency policy for the organisation.

The IT Governance transparency policy enables every member of the organisation to understand and participate in organisational initiatives and projects. This is further confirmed by Robles, Park and Kim (2008) when they argue that a characteristic theme of IT Governance discussion is that the IT capability can no longer be a black box. IT Governance implies a system in which all organisation stakeholders including the board, internal customers, and in particular, departments have a necessary input into the decision making process.

The role of IT Governance in an organisation is described in terms of its relationship with other disciplines (Robles, Park, and Kim, 2008):

IT Governance supports:

i.   Business Service Management is a strategy and approach for linking key IT components to the goals of the organisation or business. This strategy enables one to understand and predict how technology impacts the organisation or business and how the organisation or business impacts IT infrastructure.

ii. Business Technology Optimisation focuses on helping the business ensure that whatever is invested in information technology meets the its needs.
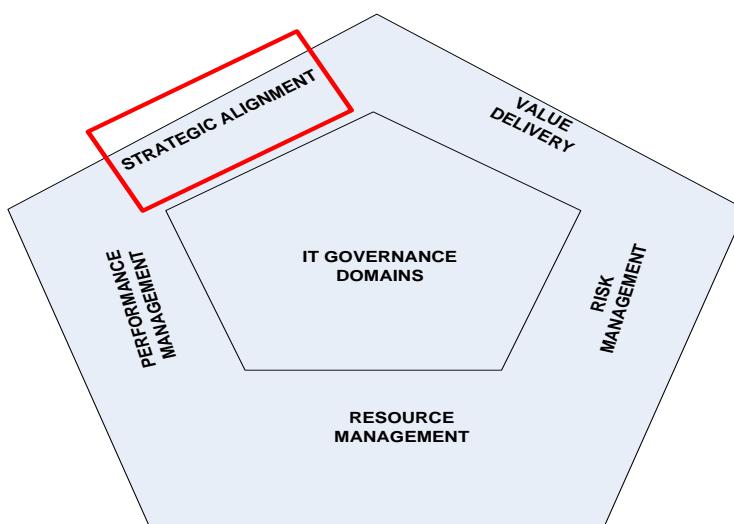
iii. Enterprise architecture is the practice of documenting the elements of business strategy, business case, business model and technologies, policies and infrastructure that make up an enterprise. Enterprise architecture can be described as a process for describing an enterprise and its information systems and planning changes to improve the integrity and flexibility of that enterprise.

iv. IT asset management is a set of business practices that join financial, contractual and inventory functions to support life cycle management and strategic decision making for the IT environment.

v. IT portfolio management is the application of systematic management to large classes of items managed by the enterprise's IT capabilities. Examples of IT portfolio management would be planned initiatives, projects, and ongoing IT services.

vi. IT Security Assessment is explicit research to locate IT security vulnerabilities and risks.

vii. IT Service Management is a discipline for managing information technology systems, philosophically centered on the customer's perspective of IT's contribution to the business.

viii. Project governance is a term which is used in industry, especially in the IT sector to describe the processes required for successful projects. Project governance is an active rather than just a controlling role.

ix. Project Management is a discipline of planning, organising, and managing resources to bring about the successful completion of specific project goals and objectives. It manages multiple ongoing inter-dependent projects.

Although IT Governance is regarded as an important issue in the organisation, it is important to define it within the relevant focus of the organisation. There are five IT Governance focus areas that can be used to guide the discussion of IT Governance in the an organisation. These IT Governance focus areas are discussed in the next section.

3.4   IT Governance Focus Areas

The five IT Governance focus areas play a vital role in the development and implementation of successful IT Governance. Although they each have a specific role to play, these domains complement each other in the process of maintaining and/or establishing new IT Governance strategies for a specific organisation (IT Governance Institute, 2007a). According to NCSU IT Governance Directions (2010), in order for the IT Governance focus areas to be effective they

should be aligned with those of the IT Strategies Operational Plan. These IT governance domains are illustrated in Figure 3.1.

Figure 3.1: IT Governance Domains (IT Governance Institute, 2005)

IT Governance domains are summarised as follows (IT Governance Institute, 2005):

- Strategic alignment focuses on ensuring the linkage of business and IT plans, defining, maintaining and validating the IT Value proposition, and aligning IT operations with enterprise operations.

- Value delivery executes the value proposition throughout the delivery cycle, ensuring that IT delivers the promised benefits against the strategy, concentrating on optimising costs, and providing the essential value of IT.

- Resource management is the optimal investment, and the proper management of critical IT resources: applications, information, infrastructure and people. Key issues relate to the optimisation of knowledge and infrastructure.

- Risk management requires risk awareness by senior corporate officers, a clear understanding of the enterprise's appetite for risk, understanding of compliance requirements, transparency about the significant risk to the enterprise, and embedding of risk management responsibilities in the organisation.

- Performance measurement tracks and monitors strategy implementation, project completion, resource usage, performance and service delivery, for example, and balanced scorecards that translate strategy into action to achieve goals measurable beyond conventional accounting.

IT Strategic Alignment is discussed in depth in the next section because it is the main focus area of this research; however, a brief outline of other areas will be presented.

3.5   IT Governance Strategic Alignment

Kordel (2004) states that when it comes to IT Governance, alignment encompasses more than strategic integration of the future IT organisation with future enterprise organisation, but the state of harmony which is alignment. Strategic alignment deals with the alignment of IT operations with the current enterprise operations and the ability to build the capabilities necessary to deliver business value. Luftman (2000) indicates that IT Governance strategic alignment provides an excellence vehicle for understanding and improving the business-IT relationship. According to Milne and Bowles (2009), the strategic alignment domain includes understanding the needs of the business, developing IT strategy, determining resource allocation, managing resource demand requests, and facilitating IT to business communication.

In the case of this research, harmony through alignment is a fundamental focus. The harmony of alignment focuses on the strategic integration of the current institutional operations and its capability to inform the institution's ability and build the capabilities necessary to deliver its value going forward (Luftman, 2001). The exercise of evaluating, introducing and implementing integrated IT and enterprise strategies to achieve a goal will take active involvement from different levels of the organisation, complemented with people who have the relevant skills.

The IT Governance Institute (2005) concurs that the alignment of IT Governance with the overall strategy of the enterprise does not happen by accident; it requires full active involvement from many levels and activities within the enterprise and requires active and focused management. They further indicate that it is a continuous effort that requires world-class expertise (either in-house or outsourced) and strong demonstrable governance. This statement further emphasises that alignment is not just a small and simple task to achieve; it requires considerable time and effort. Successful IT and business alignment is informed by satisfactory answers to the following questions (IT Governance Institute, 2005):
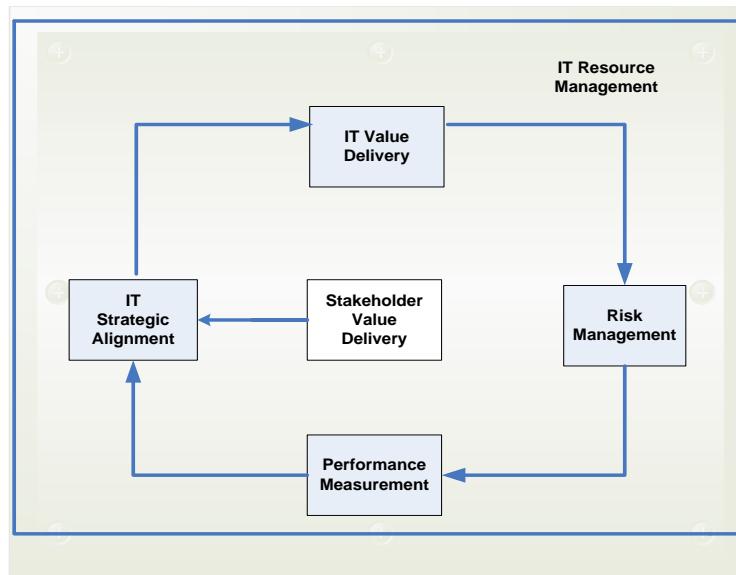
- Are we doing the right things?

- Are we doing them the right way?

- Are we getting them done well?

- Are we getting the benefits?

These questions assist in identifying who is actually responsible for the strategic alignment between IT and business management. The definition of IT Governance as alluded to earlier by different authors clearly confirms that IT strategy setting and implementation should rest on the business leadership. IT Governance Institute and Price Waterhouse Coopers (2009) further emphasise that executive management is accountable for IT Governance and share the role of key champion with non-executive management; hence IT strategic alignment is a leadership responsibility.

According to the IT Governance Institute (2003), IT Governance is concerned with two things, Information Technology's delivery of the value to the business and mitigation of risk. Value delivery is driven by strategic alignment, and risk management is driven by embedding responsibility into the enterprise. IT Governance concerns the need to be supported by adequate resources and measured to ensure that the results are obtained. IT Governance processes consist of five main focus areas supported by stakeholder value as defined in 3.4. IT Governance's main focus areas are driven by two outcomes, value delivery and risk management; and three drivers namely strategic alignment, resources management and performance measurement. IT Governance is a continuous life cycle illustrated in Figure 3.1, which can be entered at any point, but usually starts with the strategy and its alignment throughout the enterprise.

Strategic alignment has been identified as the point of departure in this research. This has been considered because the strategic alignment in the IT Governance life cycle is about:

- How to align IT strategies with business?

- What to consider when formulating IT strategies?, and

- How to implement IT strategies?

Figure 3.2: Focus Areas of IT Governance (IT Governance Institute, 2003)

The IT Governance main focus areas are defined in section 3.4. However, the life cycle does not operate in a vacuum, but operates in an environment influenced by (IT Governance Institute, 2003):

• Stakeholder value

• The mission, vision and values of the enterprise

• The community and company ethics and culture

• Applicable laws, regulations and policies, and

• Industry practices.

This is supported by IT Governance Institute (2005), which emphasises that overall enterprise strategy does not happen by accident but requires full active involvement from many levels and activities within the enterprise and requires active and focused management. Having identified the need for the engagement of different entities in achieving effective strategic alignment in the organisation, it is therefore important for one to understand how these structures work together to achieve a particular goal. The IT Strategic Alignment serves as an enabling tool in defining the harmony of IT strategies in relation to the organisation's strategy and goals because IT Strategic Alignment focuses on aligning with the business and providing collaborative solutions to the enterprise (IT Governance Institute, 2003).

The question is: How can an organisation manage IT Strategic Alignment effectively? This question has been debated for a long time and addressed by different authors. Henderson and Venkatraman (1993) developed a Strategic Alignment Model for conceptualising and directing the emerging area of strategic management of information technology in their attempt to address the above question. The Henderson and Venkatraman model is described in detail in section 3.6.4. This research used some of the best practices to define the strategic alignment model in a timely context as defined by Papp (2001). Best practices are defined in the following section.

3.6   IT Governance Best Practices

IT Governance best practices are the key control models used to assist an organisation in achieving effective IT Governance. Authors such as Weil and Ross (2004) state that effective IT Governance is the single most important predictor of the value an organisation generates from IT. The organisations that focus on IT strategies achieve above average in their IT Governance. Effective IT Governance is therefore achieved through the embracing and use of the best control models. There are different control models in the market that can be used to guide an organisation's processes in establishing effective IT Governance. The list of control models discussed in this research include but are not limited to Strategic Alignment Maturity Assessment tools, COBIT, Val IT, King III Report, Capacity Maturity Model (CMM), Capacity Maturity Model Integration (CMMi), and People Capacity Maturity Model (P-CMM).

The focus of this research is on COBIT and Luftman Strategic Alignment Matuarity Assessment and also touches on other practices.
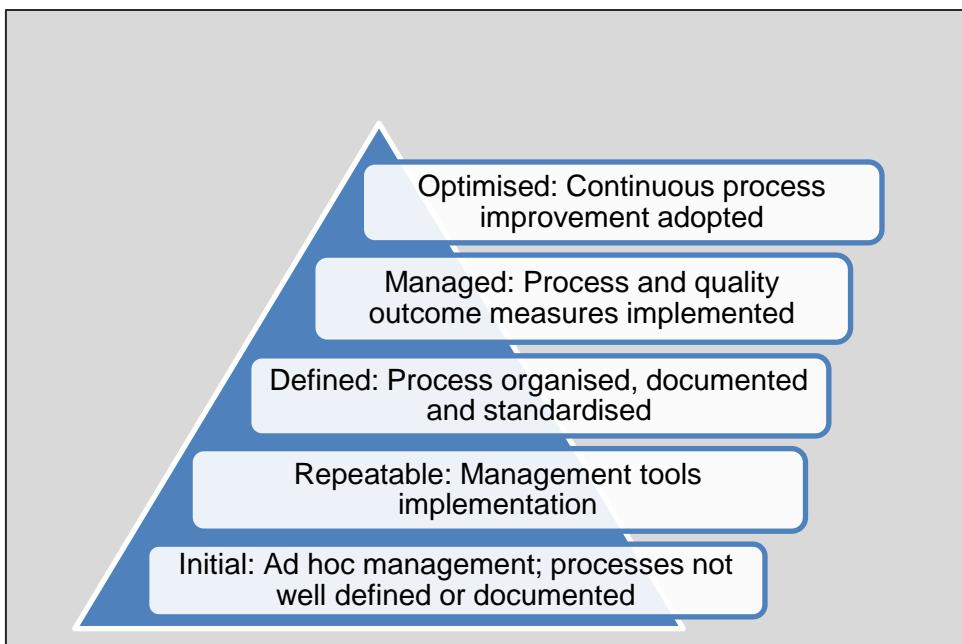
3.6.1   Capacity Maturity Model (CMM)

The CMM is broadly referred to as a process improvement approach that is based on a process model which was developed by the Software Engineering Institute (SEI) (Rouse, 2007). The CMM was initially developed for software engineering in delineating the characteristics of a mature and capable software process to be used for:

- Software process improvement, in which an organisation plans, develops, and implements changes to its software process

- Software process assessments, in which a trained team of software professionals determines the state of an organisation's current software process, determines the high-priority software process related issues facing an organisation, and obtains organisational support, and

- Software process improvement and software capability evaluations involve a trained team of professionals who identify contractors qualified to perform software work or monitor the state of the software process used on an existing software effort.

Paulk, Weber, Garcia, Chrisis and Bush (1993) describe CMM as an evolutionary improvement path from an *ad hoc*, immature process to a mature, disciplined process that can improve the ability of organisations to meet their goals within a scheduled time at the cost allocated to the project. CMM provides for continuous process improvement over five staged levels that provide top-level structure in achieving a mature software process (Paulk, 2001). As the organisation moves through the stages of the maturity levels, processes become more and more predictable, effective and controlled. Figure 3.3 illustrates the maturity levels.

Figure 3.3: CMM Process Areas and Maturity Levels Source (Ten Have, Ten Have, van der Elst, & Pol-Coyne, 2003)

- The initial level of the CMM is the lowest maturity level in the organisation where processes are not well defined and the organisation does not provide a stable environment; they mostly overspend, fail to meet their deadlines and at times abandon their projects because of the lack of guidance.

- The repeatable level of the process discipline helps to ensure that existing practices are retained and can be repeated and used as a base for different projects. Though this level

seems to be better than the initial phase, it also has the risk of exceeding cost and time estimates in executing the project processes.

- The defined level is established and improved over time; its standard processes are used to establish consistency across the organisation and the standards used are tailored from the organisation's set of standard processes to suit a particular organisation unit and/or projects which make it different from the second level.

- The managed level uses precise measurements where management can effectively control the software development effort and further identify ways to adjust and adopt the processes for a specific project without losses of quality or deviation from the specification.

- The optimising level continually improves process performance through innovative technology and further revises and improves the organisation's objectives for improving its activities.

The CMM model focus on specific areas of the organisation that can improve activities relevant to the CMM such as software CMM, people CMM and software acquisition CMM but lacks a holistic approach of addressing organisation-wide integrated issues (Constantinescu & Jacob, 2004). In an attempt to respond to the limitations of the CMM relating to organisation-wide activities; the P-CMM and CMMi models were developed to extend the CMM model. The CMMi expanded the CMM concept to include multiple disciplines to help organisations improve their product and service development, acquisition and maintenance, whereas P-CMM extended CMM to improve the capacity of the workforce.

3.6.2 Capacity Maturity Model Integrated (CMMi)
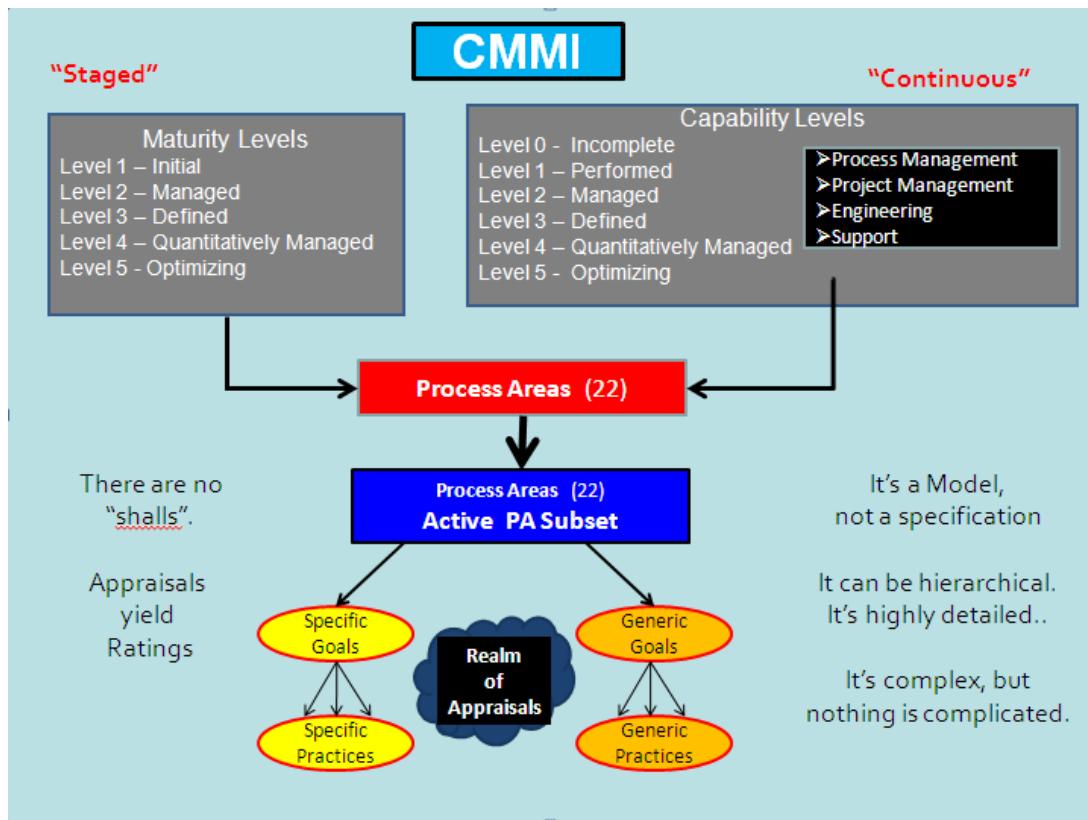
The CMMi is a process improvement approach which was developed by the group of experts who combined different source models into one single improvement model (Kulpa, 2010; Constantinescu & Jacob, 2004). CMMi processes are rated according to their maturity levels which are defined as initial, managed, defined, quantitatively managed and optimising. The process areas of maturity levels are illustrated in Table 3.2. Kupla (2010) points out that CMMi addresses three areas of interest, namely CMMi for development, CMMi for service and CMMi for acquisition. The CMMi for development focuses on the development and maintenance of products for software development and other complex systems. CMMi for service focuses on service establishment and management whereas CMMi acquisition focuses on product and service acquisition. The CMMi is not a process, standard, directive, regulation, or description; it

is not a list of "Shalls" that might require big changes in how work is done but describes WHAT to do, not HOW to do it.

Table 3.2: CMMi Process Areas by Maturity Level (Kulpa, 2010)

Level	Focus	Process Area	Results
5 Optimising	Continuous Process Improvement	Organisational Innovation and Deployment Casual Analysis and Resolution	Quality Productivity
4 Quantitatively Management	Quantitative Management	Organisational Process Performance Quantitative Project Management	
3 Defined	Process Standardisation	Requirements Development Technical Solution Product Integration Verification Organisational Process Focus Organisational Process Definition + IPPD Organisational Training Integrated Project Management + IPPD Risk Management Decision Analysis and Resolution	
2 Managed	Basic Project Management	Requirements Management Project Planning Project Monitoring and Control Supplier Agreement Management Measurement and Analysis Process and Product Quality Assurance Configuration Management	Risk Rework
1 Initial			

CMMI models provide guidance for developing or improving processes that meet the business goals of an organisation. A CMMI model may also be used as a framework for appraising the process maturity of the organisation. The models can also be tailored to bestfit an organisation's needs. The CMMi comprises two representations that can be selected, namely continuous and staged views. The continuous representation is designed to allow the user to focus on the specific processes that are considered important for an organisation's immediate business objectives, or those to which the organisation assigns a high degree of risk. The staged representation is designed to provide a standard sequence of improvements, and can serve as a basis for comparing the maturity of different projects and organisations. The CMMi representations are illustrated in Figure 3.4.
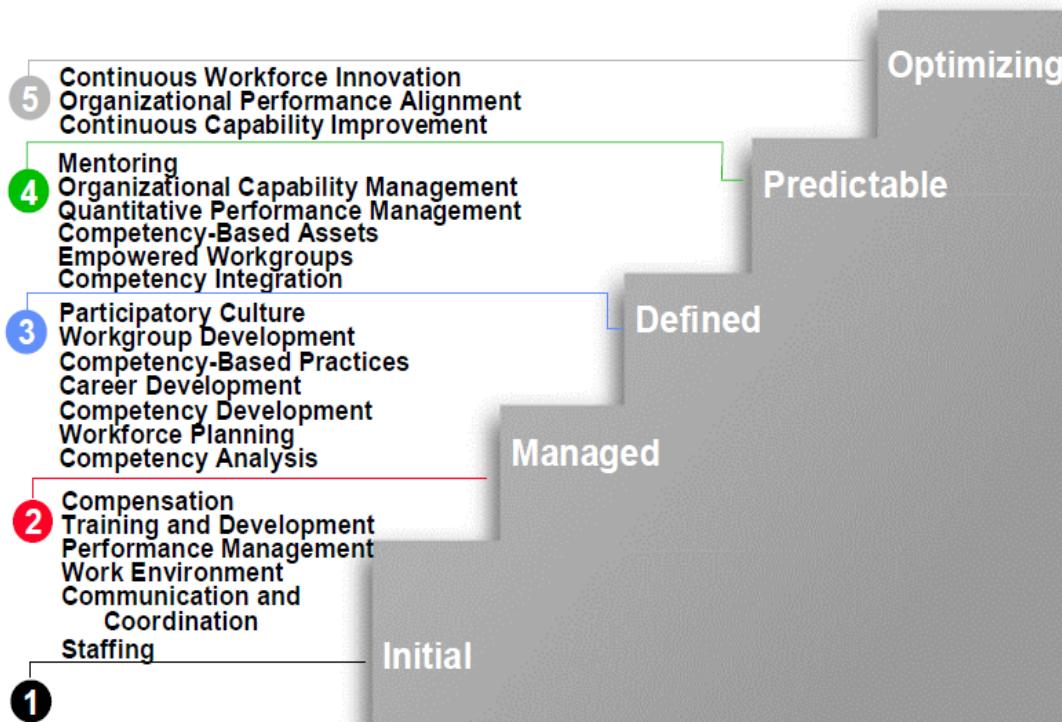
Figure 3.4: CMMi Representations (Kulpa, 2010)

Figure 3.4 demonstrates the continuous and staged representations of CMMi and further indicates how these presentations are linked into focus areas known as process areas. Each process area has specifically stated goals that have to be met in order to have "maturity" or "capability" in the process area. Each process area has specific practices, sub-practices, typical work products (outputs), examples, and other informative material. Most of the goals are specific to the process area, but there are some generic or "global" goals common to all of the process areas.

3.6.3   People Capacity Maturity Model (P-CMM)

The focus of an organisation's success has been more on software and systems engineering and improving process maturity; these factors have posed a challenge of maintaining and recruiting talented a workforce which further stretched on talent war (Curtis, Heflley, & Miller, 2001). A tool to help organisations successfully address critical people issues was introduced in the form of P-CMM. The main objective of P-CMM is to improve capacity in areas such as knowledge, skills and the ability to perform the organisation's process activities (Curtis, Hefley, & Miller, 2009). P-CMM is also defined by Curtis *et al.* (2009) as a roadmap for implementing workforce practices that continuously improve the capability of an organisation's workforce that

set priorities for improvement and establish a culture of excellence. The P-CMM is constructed with five levels of maturity, each maturity level providing a foundation of practices on which practices at subsequent maturity levels can be built. Figure 3.5 presents P-CMM process areas.
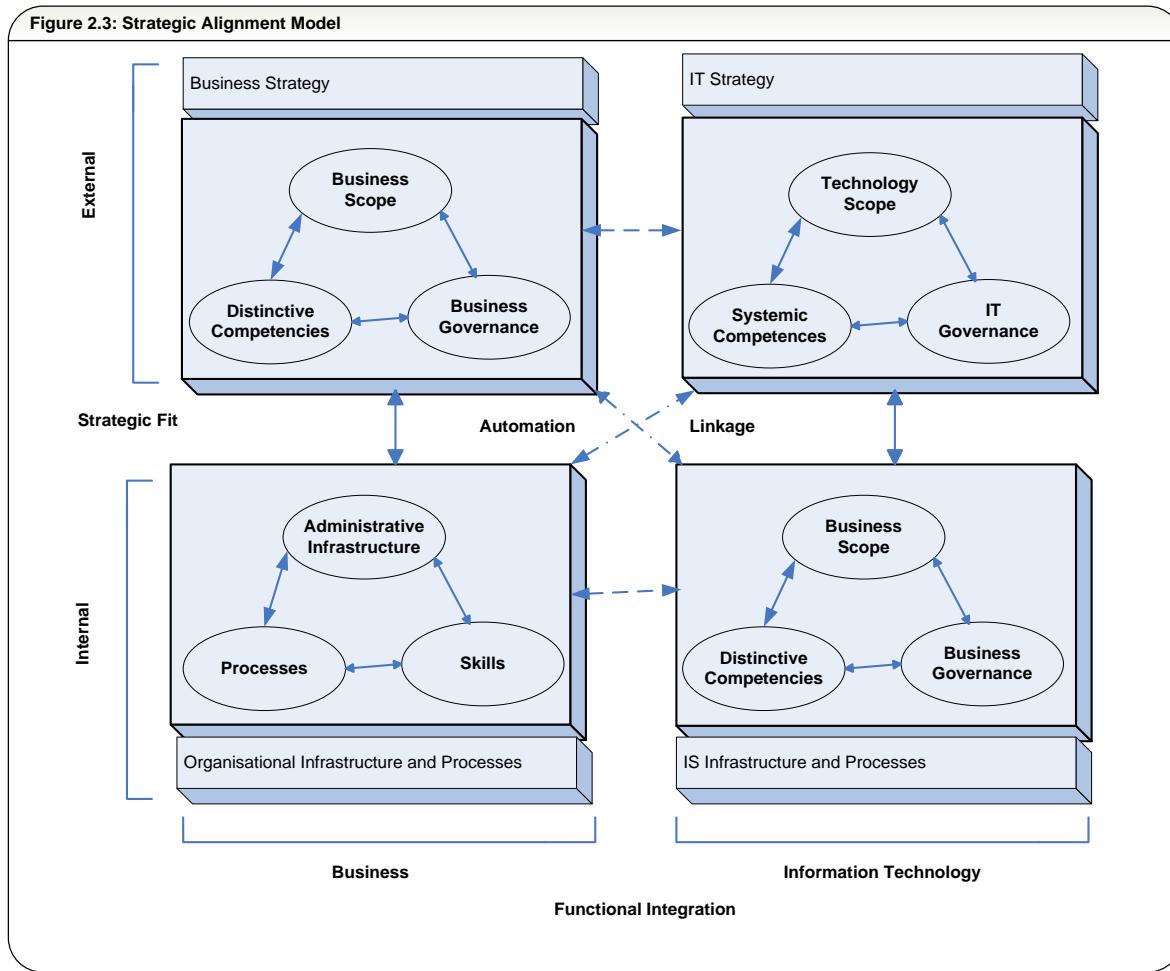
Figure 3.5: Process Areas of P-CMM (Curtis, Hefley, & Miller, 2009)

Figure 3.5 demonstrates the link between the P-CMM maturity levels and the Process Areas. As depicted in Figure 3.5, the initial maturity level 1 has no process areas and the organisation has no specific functioning structure and tends to be inconsistent in identifying its workforce. Other maturity levels between level 2 and level 5 illustrate the increasing abilities of each level in achieving the capacity of workload that results in the improvement of each maturity level performance. The focus of these models is mainly on the improvement of maturity in process areas, but the next section will define the model that focuses mainly on the alignment of business and information technology.

3.6.4 Henderson and Venkatraman Strategic Alignment Model

This strategic alignment model is defined in terms of four fundamental domains of strategic choice namely: business strategy, information technology strategy, organisational infrastructure and processes and information technology infrastructure and processes. The power of this model is illustrated in Figure 3.6 in terms of two fundamental characteristics of strategic alignment such as strategic fit (the interrelationships between external and internal components)

and functional integration (integration between business and functional domains). Linkages define the interrelationship between the domains of the strategic alignment model. The first linkage is a vertical one, that of strategic fit, and the second linkage is the corresponding horizontal one refered to as functional integration. This extends the principle of strategic fit to the functional domains of business and information technology.

Figure 3.6: Strategic Alignment Model (Henderson & Venkatraman, 1993)

The business strategy domain serves as the driving force and consists of three components namely: busines scope, dinstictive competencies and business governance. Business scope focuses on the type of business the organisation is engaged in, the products and/or services it offers, competition, and the values and mission of the organisation. The distinctive competencies include the areas in which the company excels, its distinctive strengths. The business governance focuses on ownership. It looks specifically at the establishment of

business alliances and partnerships with other firms, government regulations and other effects as well as outsourcing strategies.

Information technology strategy is an enabler and a counterpart to business strategy. It consists of information technology scope, systematic competencies and information technology governance. Technology scope like business scope, focuses on the key technologies and applications the business should and/or must employ. It looks at what specific information technology is needed to achieve the critical success factors as well as what the competition uses. Systematic competencies include information about the company's customers and clients, accessibility, reliability, and other vital characterisics and strengths of information technology. The information technology governance addresses many of the same issues as business governance. It focuses on the decision to make-or-buy, the prioritisation of applications, and the possibility of technological alliances and partnerships.

The organisation infrastructure domain is the quadrant which consists of components such as administrative structure, processes and skills. Administrative structure consists of the authority structure, responsibilities and management, the extent to which decision making is centralised or decentralised, and geographical orientation of the firm. Business processes are those activities that drive the business. They determine the extent to which work flows can be integrated with respect to information technology. Business skills focus on the human resources of the firm and concentrate on the training and experience of employees and the assessment of human resources for the achievement of business goals.

Information technology infrastructure focuses on the improvement of information technology based on the implementation of emerging and existing information technology infrastructure. Information Technology infrastructure consists of information technology architecture, processes and skills. Information technology architecture includes the hardware, software and communication tools used to achieve information technology and business strategies. The processes focus on the development of specific information technology practices and how they can be improved. The human resourse recruits people with relavant skills, experience and competencies in the filed of IT.

The original strategic aligment model by Henderson and Venkatraman (1993), has been used for more than two decades but was never more relevant than it is today (Papp, 2001). This original strategic model has since been adopted for use by virtually any industry looking to integrate their busness strategies with their information technology strategies (Luftman, Papp, & Brier, 1999). The components of the strategic alignment model in conjuction with the enablers

and inhibitors research form the building blocks for the Luftman's strategic alignment maturity assessment method (Luftman, 2000). This strategic alignment model has also been the foundation for other best IT practices such as Control Objectives for Information and related Technology (COBIT) because COBIT's plan and organise process descriptions consist of all the components of the strategic alignment model defined in Figure 3.6.

3.6.5 Luftman Business-IT Alignment Maturity

Luftman Strategic Alignment Maturity Assessment provides an organisation with a vehicle to understand and identify opportunities for enhancing the harmonious relationship between business and IT (Luftman, 2000). The alignment maturity assessment checks if opportunities can be achieved by evaluating business-IT alignment in terms of where the organisation is and what it can do to improve and achieve its objective (Luftman, Papp & Brier, 1999; Luftman, 2000; Luftman, 2003). The Society for Information Management (SIM) survey report captured by Luftman and Ben-Zvi (2010) indicates that aligning IT and business is still the main concern of IT managers and has been rated third place on the list of top ten management concerns in Europe whereas it is rated first in the U.S (Luftman & Ben-Zvi, 2010; Luftman, 2001). The SIM report further indicates that aligning IT and business has been a principal concern for IT managers for almost 30 years and has been number one between 2003 – 2006, and in 2008 and rated number two in 2007 and 2009.

Since researchers have identified that focusing on IT alignment in isolation to business strategies has been a challenge (failure) in achieving business objectives these researchers confirm that a business-IT alignment maturity assessment tool is the best tool to achieve an organisation's objectives of employing a timely and appropriate harmonised business-IT strategy (Luftman, 2001; Luftman & Ben-Zvi, 2010). The business-IT alignment assessment tool was successfully tested in more than 60 Global 2000 companies (Luftman, 2003). The effectiveness of the Business-IT alignment maturity assessment tool is informed by the twelve components of alignment as defined in Figure 3.6 and in section 3.6.4 illustrating the building blocks required for the strategic alignment maturity assessment method (Luftman, 2000).

Luftman (2000) emphasises that the effectiveness of alignment needs collaborative work, support and understanding, trust, appropriate prioritisation and effective communication of business and technical environments by senior management of the organisation. However, alignment is also influenced by internal and external organisational inhibitors and enablers highlighting the need to minimise the inhibitors and maximise the enablers in achieving the effective alignment (Luftman, Papp & Brier 1999; Luftman 2000). According to Luftman *et al.*
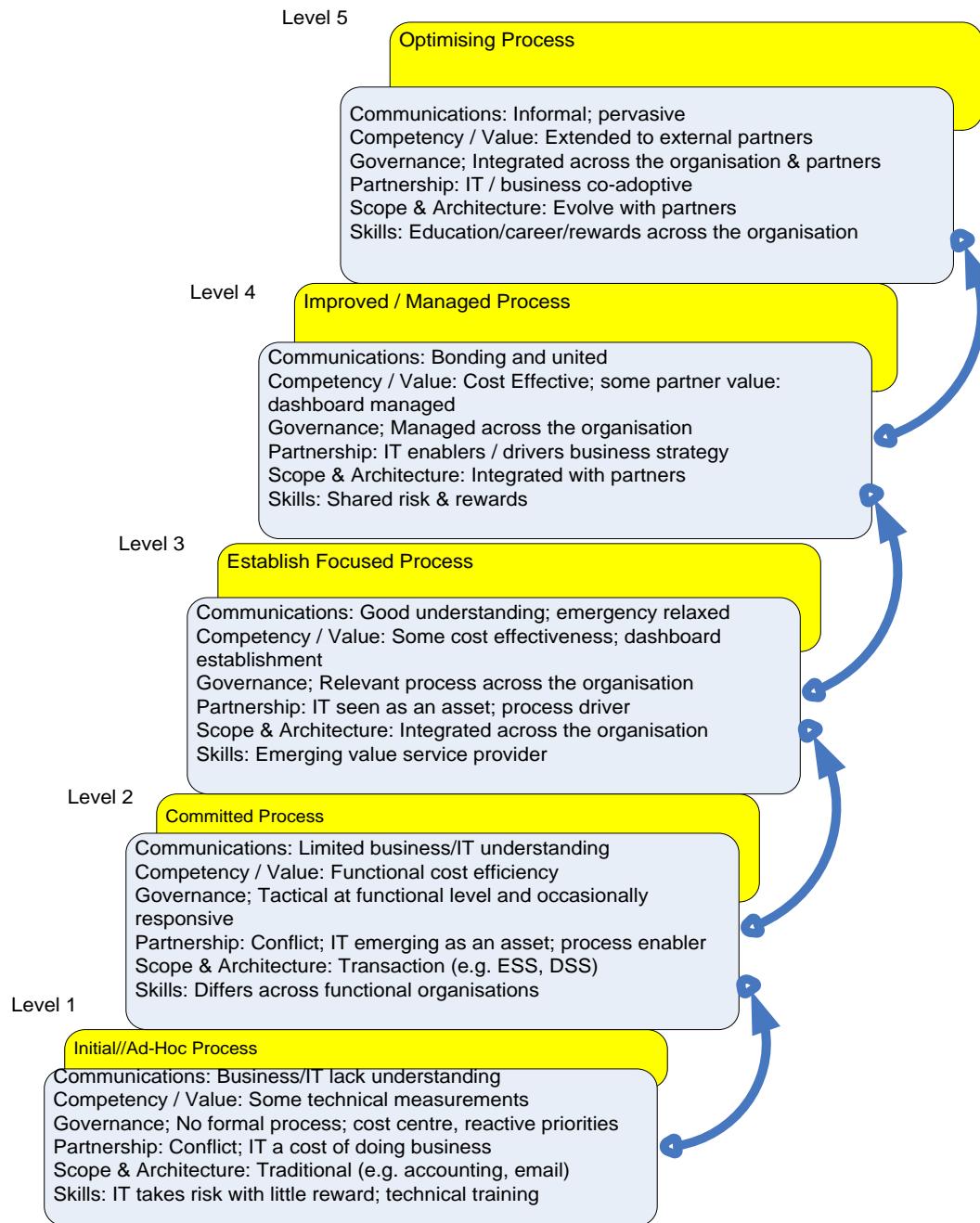
(1999), inhibitors are areas in the organisation that hinder the process of achieving effective alignment whereas enablers are areas that help an organisation to achieve effective alignment. The process of maximising the enablers and minimising the inhibitors in an organisation is challenging because when there are not enough resources to maximise enablers the organisation is subject to failure. When there are barriers (inhibitors) within the organisation it is also subject to failure. The study by Luftman, Papp and Brier (1999) lists the main stategic alignment inhibitors and enablers in Table 3.3.

Table 3.3: Enablers and Inhibitors of Strategic Alignment (Luftman, Papp, & Brier, 1999)

ENABLERS	INHIBITORS
• Senior executive support for IT	IT/business lack close relationship
• IT involved in strategy development	IT does not priotirise well
• IT understands the business	IT fails to meet cimmitments
• Business-IT partnership	IT does not understand business
• Well priotirised IT projects	Senior executive does not support IT
• IT demonstrates leadership	IT management lacks leadership

The enablers and inhibitors can be translated differently by different organisations because organisations have different processes and produce different products. Hence it is important that organisations focus on the activities management does or does not do to achieve its goals (Luftman, Papp, & Brier, 1999). The observations of indicators of inhibitors and enablers are equally important for every organisation; hence key words such as IT, executive support, understanding of business-IT relations and leadership appear in both columns. The enablers and inhibitors are directly linked to an organisation's strategic alignment maturity because the level of inhibitors and enablers can also define the level of strategic alignment in the organisation. Luftman (2000), indicates that inhibitors and enablers become part of day-to-day operations of the executives, and are then directly linked to strategic alignment.

The Strategic Alignment Maturity Assessment model has five levels of strategic alignment maturity that in turn focus on a set of six criteria (Luftman, 2001). The levels of strategic alignment maturity assessment are essential for each strategic alignment criterion, and strategic alignment criteria are defined and used in each level of strategic alignment maturity. The strategic alignment maturity assessment is described in Figure 3.7.

Level 5

Optimising Process

Communications: Informal; pervasive
Competency / Value: Extended to external partners
Governance; Integrated across the organisation & partners
Partnership: IT / business co-adoptive
Scope & Architecture: Evolve with partners
Skills: Education/career/rewards across the organisation

Level 4

Improved / Managed Process

Communications: Bonding and united
Competency / Value: Cost Effective; some partner value: dashboard managed
Governance; Managed across the organisation
Partnership: IT enablers / drivers business strategy
Scope & Architecture: Integrated with partners
Skills: Shared risk & rewards

Level 3

Establish Focused Process

Communications: Good understanding; emergency relaxed
Competency / Value: Some cost effectiveness; dashboard establishment
Governance; Relevant process across the organisation
Partnership: IT seen as an asset; process driver
Scope & Architecture: Integrated across the organisation
Skills: Emerging value service provider

Level 2

Committed Process

Communications: Limited business/IT understanding
Competency / Value: Functional cost efficiency
Governance; Tactical at functional level and occasionally responsive
Partnership: Conflict; IT emerging as an asset; process enabler
Scope & Architecture: Transaction (e.g. ESS, DSS)
Skills: Differs across functional organisations

Level 1

Initial//Ad-Hoc Process

Communications: Business/IT lack understanding
Competency / Value: Some technical measurements
Governance; No formal process; cost centre, reactive priorities
Partnership: Conflict; IT a cost of doing business
Scope & Architecture: Traditional (e.g. accounting, email)
Skills: IT takes risk with little reward; technical training

Figure 3.7: Strategic Alignment Maturity Assessment (Luftman, 2000)

Figure 3.7 illustrates five levels of strategic alignment maturity assessment processes as follows:

a. Initial/Ad Hoc

b. Committed

    c. Established Focus

    d. Improved/Managed

    e. Optimised.

The six criteria illustrated in Figure 3.7 are described as follows:

- Communications include the continuous and constant exchange of ideas, knowledge and information between business and IT in ensuring that both parties understand the organisation's strategies and the processes required in achieving the organisation objectives of business-IT strategic alignment.

- Competency/value measurement focuses on measuring the level at which IT demonstrates its contribution to the organisation in a language which is understandable and acceptable to the organisation. It provides controls that measure the performance factors in the organisation.

- Governance focuses on describing the process of entrusting business-IT decision-making between the organisation's executive management and IT managers in ensuring that the appropriate business and IT participants formally discuss and review the priorities and allocation of IT resources.

- Partnership is the relationship between business and IT that enables both parties to have an equal opportunity and role in defining business strategies. This further determines the level of trust and acknowledgment of efforts by both parties.

- Scope and Architecture define the ability to which IT is able to:

    o go beyond the back office and the front office of the organisation

    o assume a role supporting a flexible infrastructure that is transparent to all business partners and customers

    o evaluate and apply emerging technologies effectively

    o enable or drive business processes and strategies, and

    o provide solutions customisable to customer needs.

- Skills measures the maturity of the organisation concerning its commitment to human resource development by implementing a proper plan for staff training and performance feedback sessions, encouraging innovation and providing career opportunities. It further

considers the organisation's readiness for change and the capability of introducing or creating new ideas.

A maturity model serves as a roadmap to the organisation when introducing effective business-IT strategic alignment in order to achieve an organisation's objectives. The process enables the organisation to evaluate its current IT strategic alignment level by identifying the gaps, enablers and inhibitors of the system, thereafter suggesting a future plan to improve a develop an informed business-IT strategic alignment framework going forward.

The Luftman Strategic Alignment Maturity assessment is used in this research to identify the current level of IT Governance in the case studies and to serve as a building block in developing a proposed framework. This research identifies the level of alignment within the institution by identifying the gaps, strengths, inhibitors and enablers and further suggests a model which will best fit the institutional environment. Hence, Luftman strategic alignment maturity assessment is relevant for this research.

3.6.6 King III Report

The King III Report is a governance compliance document which was voluntarily accepted by 56 countries in the Common Wealth including South Africa and the 27 States in the AU including the United Kingdom (The Institute of Directors in Southern Africa, 2009). The King III Report is an extension of King I & II which focused mainly on compliance governance practices guided by the "comply or explain" principle over and above the other legislated governance issues. The "comply or explain" principle was later identified as a limitation in conveying King Committee objectives of identifying how the principles and recommendations could be applied instead of using them as a compliance tool. The King III Report adopted another principle known as "apply or explain" which conveys the King Committee's intent to guide directors in deciding on the best practices to achieve the objectives of the corporate governance principles and to further explain how the principles and recommendations should be applied.

There were important elements of the corporate governance which the King I & II document did not address that are now captured as new chapters in the King III report. The new chapters in the King III report capture issues such as business rescue, application of the code, language gender and terminology, effective date, appreciation and information technology governance. One of the areas of interest is Information Technology Governance because this addresses the focus area of this research. The King III Report identified seven principles of IT Governance which are summarised in Table 3.4.

Table 3.4: The Governance of IT (The Institute of Directors in Southern Africa, 2009)

Principles	Description of principles	Relevance to the research
Principle 1: The board should be responsible for IT Governance	The board should: • Understand the strategic importance of IT and placing IT Governance on the organisation board agenda • Take ownership and be responsible for all IT Governance activities and strategically facilitate the effective and efficient management of IT resources in achieving the organisation's objectives. • Facilitate the establishment of the appropriate and applicable IT Governance framework within/for the organisation that includes relevant structures, processes and mechanisms to enable IT to deliver value for the organisation and mitigate IT risk. • Ensure that IT Governance framework is integrated into the overall corporate governance of the organisation. • Establish and implement IT Governance charter and policies and ensure that the framework outlines the decision-making rights and accountability framework. • Cultivate and promote the IT Governance ethical culture, awareness and common IT language within the organisation. • Ensure that the organisation embraces the IT reporting processes at all levels of the organisation.	The recommendations on the proposed IT Governance model for WSU in Figure 6.8 and 6.10 in Chapter 6, define the relevance of principle one to this study. • WSU Institutional Management Committee (IMC) is suggested to be an overall driver of the university IT Governance strategy. • It is also proposed that the university IT strategy should be integrated into the institutional strategic plan which is a responsibility of the IMC at WSU. • Develop clear IT Governance policies and procedures document that will guide the ICT activities at WSU. • Figure 6.9 illustrate the proposed model which outlinest the involvement of functional departments of the university that will work and report on the WSU IT forum
Principle 2: IT is aligned with the performance and sustainability objectives of the company	The board should: • Ensure that the IT strategy is aligned and integrated with the organisation's strategic and business processes that add value in improving the organisation's performance and sustainability. • Ensure that the business operational plans are aligned with the IT plans. • Ensure that the IT alignment processes are integrated into the strategic, management and operational level in the execution of the organisation's strategic objectives. • Through the effective and efficient use of IT exploit the opportunities of performance improvement and sustainability.	• The proposal of having IT Governance forums at the academic and support departments and faculties as depicted in Figure 6.8 and 6.9 confirms that principle 2 is addressed and relevant to this study. The integration of the cyclic reporting structure of IT activities promotes the strategic alignment and easy sustainability plan.

Principles	Description of principles	Relevance to the research
Principle 3: The Board should delegate to management the responsibility for the implementation of an IT Governance framework	The management should: • Be responsible for all structures, processes and mechanisms to execute the IT Governance framework. • Implement IT Governance framework with a view to minimising the IT risk, deliver value, manage the IT resources and ensure business continuity. • Update the Board with the IT functions. The Board should: • Identify the IT Governance forum consisting of the IT people and the representative of other departments within the organisation. • Appoint the CIO who shall be the link between the board and the organisation's stakeholders at large	The proposed ICT executive advisory board and other ICT forum, high level ICT forums as outlined in Figure 6.10 supports principle 3. It therefore highlights the relevance of this principle in this study. The importance of principle 3 is also captured in Figure 6.8 on the proposed and future considerations of IT structures at WSU.
Principle 4: The board should monitor and evaluate significant IT investments and expenditure	• The organisation should acquire and use appropriate technology, processes and people in supportive of its business and process requirements. • The board should oversee the proper value delivery of IT and further confirm that IT delivers according to the project's specifications. • Ensure that all parties involved in the supply chain process understand and apply good IT principles. • The organisation should ensure that all the basic elements of appropriate project management principles are applied to all IT projects.	The suggested ICT administration, planning and budgeting team in collaboration with the ICT project advisory team and the ICT steering team are strategically proposed to champion the planning, monitoring, evaluation and maintenance of the university ICT resources which are directly in support of principle 4 and highlight its relevance to this study.
Principle 5: IT should form an integral part of the company's risk management	The board should: • Consider applying the codes and standards, related IT laws and adhere to them. • Board should consider how IT can be used to assist the organisation in managing the risk and compliance with laws, codes and standards. • Obtain formal information management processes in achieving compliance with external regulation.	The ICT steering team and ICT awareness programme team collaborate with ICT campus coordinators and ICT faculties' advisory committees are proposed to provide input to the IMC in developing procedures and laws that will effectively guide the university compliance with the internal and external ICT regulations. This therefore is in support of principle 5.
Principle 6: Board should ensure that information assets are managed effectively	The Board should ensure that there are systems in place for the: • Management of information assets and the performance of data functions • Information privacy and • Information security	The notion of principle 6 is captured in the definition of principle 5, and they are both relevant to this study.

Principles	Description of principles	Relevance to the research
Principle 7: A risk committee and audit committee should assist the Board in carrying out its IT responsibilities	The risk committee should ensure that: • IT risk is adequately addressed • They understand the organisation's overall exposure to IT risk from a strategic and business perspective • Work with auditors to oversee the overall financial risk of IT activities within the organisation.	The establishment of ICT forums at the departmental level were proposed as indicated in Figure 6.8 under proposed IT Governance structure as a strategic move for the university to establish and communicate risk that can be presented in the relevant forums for prevention or controlling purposes. This is in support of principle 7 which confirms its relevance to this study.

3.6.7   VAL IT

The introduction or improvement of value management practices in an organisation is a complex exercise that requires critical decision-making from management; hence Val IT was introduced to provide guidance for this complex exercise (Harries & Harrison, 2008). There are challenges that hinder the effective implementation of value management principles in the enterprise referred to as "tipping points" by Harries and Harrison such as: major IT project failures, serious budget overruns, inability to absorb changes brought by new technologies, and lack of understanding of IT business value by executive management of the organisation. Val IT became a solution to these tipping points.
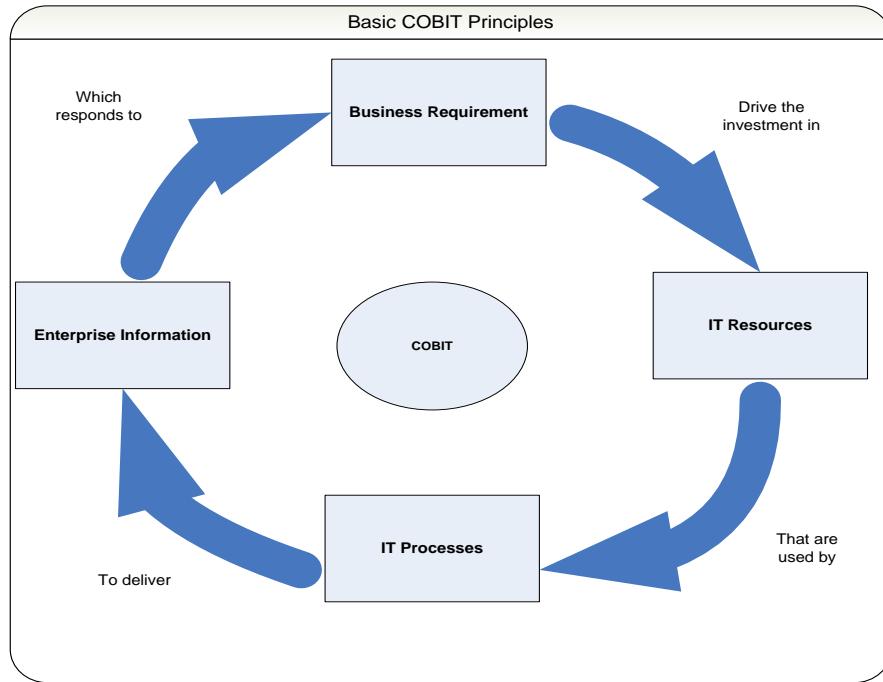
Val IT is a governance framework that provides a set of management principles, processes and practices that enable the enterprise to maximise the delivery of business value from investment involving IT (IT Governance Institute, 2008b). These principles are developed to support leadership in the organisation at different levels by providing clear and consistently applicable guidelines and supporting practices. They further guide the organisation's Board and executive management in carrying out their IT-enabler business investment roles in ensuring that IT provides the optimal value at a reasonable cost with known and acceptable risk (IT Governance Institute, 2006). Val IT and COBIT frameworks complement each other; the IT Governance institute indicates that Val IT extends and complements COBIT. Val IT focuses on delivering business value while COBIT delivers the technology capacity that is required. The Val IT focuses on decision-making and realisation of benefits by answering the questions, "are we doing the right things and are we getting the benefits?", whereas COBIT focuses on the execution by answering the questions, "are we doing them the right way and are we getting them done well?" The focus of this research is on finding a way to deliver the technology

capacity that an organisation needs; hence the focus will be more on COBIT than Val IT. The Val IT can be used in the stage of implementing the proposed IT Governance model which will look closely at the value component of the organisation of the IT Governance framework. It is almost impossible to discuss execution practices of an organisation without considering the factor of the value, because the execution of processes should produce value.

3.6.8   Control Objectives for Information and Related Technology (COBIT)

Control Objectives for Information and Related Technology is a good guide for implementing effective IT Governance in the organisation. They consists of the best standards recognised world-wide (Hardy, 2006); COBIT standards are easily integrated with other best practices and are known as the best practice for IT Governance, security and controls (IT Governance Institute, 2008a). The demand for effective IT Governance in the private and public sector has also increased the level of COBIT standards adoption and acceptance. COBIT has been adopted by a few organisations because of its credibility and practical relevance in helping business managers to bridge the gap between control requirements, technical issues and business risk (IT Governance Institute, 2005; Hardy, 2006; Ahmad & Abu 2009). The COBIT framework has been under development since its first publication in 1996 (Ahmad & Abu, 2009), but still maintains its main objective of providing good practices across the business domain and process in a logical and manageable structure (IT Governance Institute, 2007c).

The main characteristics of the COBIT framework were identified as being business-focused, process orientation, control-based and measurement-driven; these characteristics are considered as basic COBIT principles (IT Governance Institute, 2007c). The COBIT framework principles are illustrated in Figure 3.8.

Figure 3.8: Basic COBIT Principles (IT Governance Institute, 2007c)

Figure 3.8 demonstrates the principle used by COBIT to achieve its goal in satisfying business objectives. The business requirement provides an organisation with the information required to achieve its business objectives, by ensuring that the organisation focuses on managing and controlling IT resources using a structured set of processes to deliver the required organisational information. Business objectives can be satisfied when the business information meets certain criteria which COBIT refers to as business requirements. According to IT Governance Institute (2007c), business requirements criteria are defined as follows:

- Effectiveness handles information which is relevant and important for the business processes, and ensuring that it is delivered in a timely, correct, consistent and usable manner.

- Efficiency focuses on an effective way of using resources to ensure the availability of economical and productive information.

- Confidentiality emphasises the protection of sensitive information from unauthorised disclosure.

- Integrity refers to the accurate, valid and complete information in terms of the organisation's values and expectations.

- Availability refers to the ability to make information available when it is required by the business process and further protects the resources and associated capabilities.

- Compliance focuses on managing compliance with laws, regulations and contractual arrangements.

- Reliability ensures that management has the necessary information to operate the entity and exercise its fiduciary and governance responsibilities.

COBIT further defines IT resource as follows:

- Application refers to the systems and procedure manuals needed to process the information.

- Information refers to various types of information systems that execute data such as input, output and processing.

- Infrastructure refers to the different technology and facilities that enable the processing of the application.

- People refers to the internal or outsourced personnel required to plan, organise, acquire, implement, deliver, support, monitor and evaluate the information systems and services.

The COBIT framework has 34 processes divided into four domains: Plan and Organise, Acquire and Implement, Deliver and Support, and Monitor and Evaluate which correlates with IT's traditional responsibility areas of plan, build, run and monitor (IT Governance Institute, 2007a, Ahmad & Abu, 2009; Steenkamp, 2009).
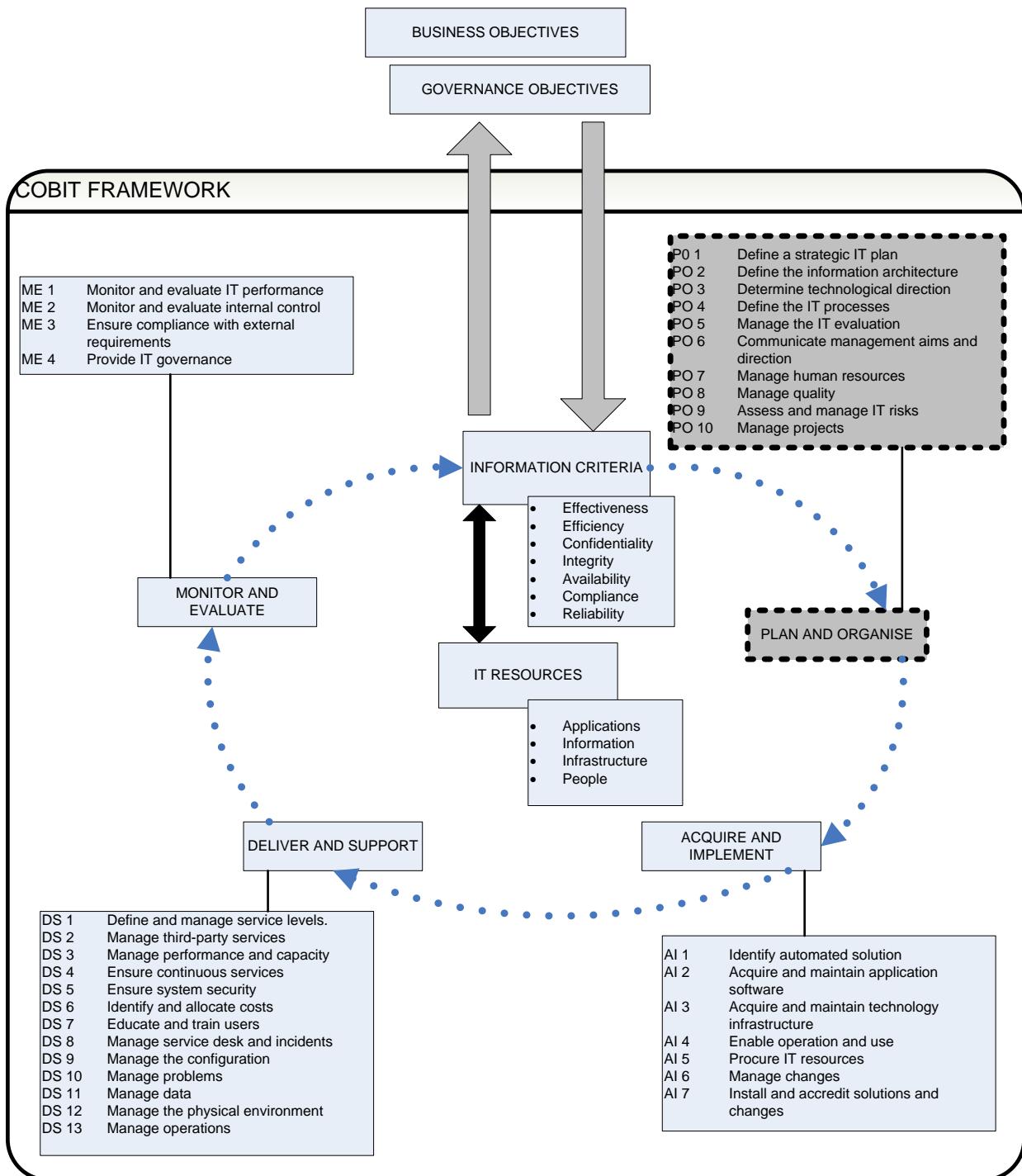
- Plan and Organise (PO) describes how IT strategy should be developed to align with business goals.

- Acquire and Implement (AI) focuses on identifying, acquiring and implementing IT solutions into business processes, and also handles the changes and maintenance to existing systems.

- Deliver and Support (DS) handles and defines the operational (day-to-day) activities of the IT system and how these activities can be managed.

- Monitor and Evaluate (ME) describes the monitoring and evaluation of IT performance to ensure quality and compliance with control requirements.

Each of the 34 processes is divided into several activities and a set of detailed control objectives. Processes are series of activities that have natural control breaks specifying what the business wants to achieve from its objectives and controlling the delivery of information. Control objectives are the statements indicating the desired results to be achieved by implementing control procedures for the process (IT Governance Institute, 2007a). Figure 3.9 illustrates IT processes within the four domains. Plan and Organise will be the main focus of this research. Plan and Organise is relevant because it will guide the process of:

- Formulating the strategies and procedures for the proposed IT Governance of the case studied.

- Identifying the best contribution of IT in achieving the business objectives of the case studied.

- Administering and managing the awareness of the IT strategic vision of the case studied.

- Executing the proposed organisational and technological infrastructure.

Information criteria and IT resources collaboratively achieve the business processes because information criteria measure the level of control in achieving the business objective. Controls are measured effectively when they are put into real practice; human resources as defined above generate, deliver and store the information that business needs to achieve which is the best time to measure the controls of the information criteria as defined above.

As much as POs are used as the maturity assessment tool, in the case studied they are used as a guide in developing the proposed IT Governance framework. For every process that will be used in developing the proposed framework the POs will be used as the check list to verify if the proposed model captures all the important components of the IT Governance for the strategic alignment focus area.
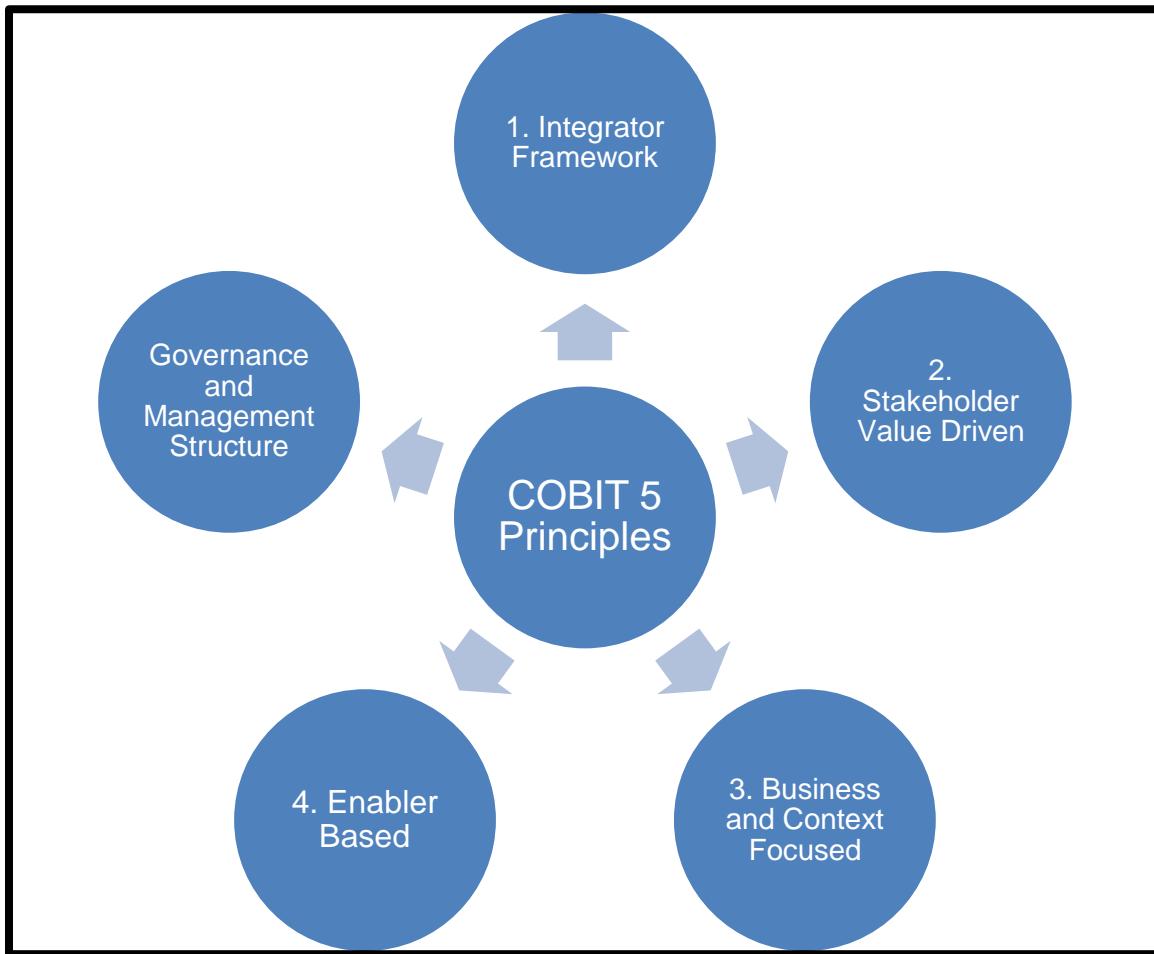
Figure 3.9: Cobit IT Framework (Sourced by IT Governance Intstitute, 2007a)

The COBIT processes illustrated in Figure 3.9 have been improved into new version COBIT 5 which provides the basis for governing and managing enterprise IT. COBIT 5 builds on previous various COBIT versions and Val IT and Risk IT Framework (ISACA, 2011). It therefore integrates all these previous versions content into one model, making it easier for users to

understand and use when implementing it. Since IT has become a key resource for all enterprise, a need for IT to be governed and managed in a holistic maner taking in the full end-to-end business and IT functional areas of responsibility has resulted into the development of new COBIT 5 version. The establishment of COBIT 5 did not make COBIT 4.1 less important but has added a number of new drivers that improve and address the IT purversive needs of the stakeholders (Service Talk, 2012). According to Service Talk (2012) the drivers that were identified leading into the development of COBIT 5 include but not limitted to the following:

- Determine value from information and related technology (what benefits at what acceptable level of risk and costs) and the priorities in ensuring that expected value is actually delivered.

- Deliver transperency to the stakeholders on how the delivery will occur and the actual results will be achieved.

- Address the increasing dependency of the enterprise's success on external business and IT parties such as outsourcers, suppliers, consultants, clients, and cloud and other service providers.

- Manage the ever-increasing amount of information that is purversive within the enterprise.

- Work more effectively with information technology which has become an integral part of the business processes.

- Deliver guidance for innovation and emerging technologies.

- Cover the end-to-business and IT functional responsibilties.

- Separate the governance and management domains.

COBIT 5 is a principles-driven farmework based on five fundamental principles as illustrated in figure 3.10.

Figure 3.10: COBIT 5 Principles (soursd by ISACA (2011)

Integrator Framework

It is said that COBIT 5 is an integrator framework because it alligns with other relavant standards and frameworks at a high level to serve as the overarching framework for governanance and management of enterprise IT. It provides a simple architecture for structuring guidance materials and producing a consistent product set.

Stakeholder Value Driven

The stakeholder value driven principle focuses on identifying all stakeholder needs and determine how they link to governance and management decisions and activities. It provides all the required processes and other enablers to support business value creation through the use of IT. COBIT 5 addresses stakeholder needs on the bases of benefits realisation, risk balancing and cost optimisation.

Business and Context Focus

COBIT 5 focus in this principle is to integrate the gonernance of enterprise IT into the enterprise governance , covering all the functions and processes within the enterprise not just IT. The principle further establishes which IT related goals corresponds to the enterprise goals. Amongst the important goals that have been established; allignment of IT and business strategy, delivery of IT services in line with business requirements, user and customer satisfaction with customers. IT agility and knowledge, expertise and initiatives for business innovation were at the top of the list. These goals drive a number of enabler goals which include process goals.

Enabler –Based

The enabler-based principle focuses on implementing a performing governance and management systems for enterprise IT. Enablers help the organisation to achieve its governance objectives through resourcessuch as information and people. COBIT 5 framework lists seven categories of eneblers:

- Processes – describe an organised set practices activities to achieve certain objectives and produce a set of outputs in support of achieving overall IT relates goals.

- Principles and policies – are the vehicle to translate the desired behaviour into practical guidance for day –to-day management.

- Organisational structures – are the key decision making entities in an organisation.

- Skills and competencies – are linked to people and are required for successful completion of al activities and for taking correct decisions.

- Culture and behaviour – of individuals and of

- Service capabilities

- Information

Enablers interact in a systemic way such that a governance and management system cannot succeed unless all enablers are dealt with and major interactions are understood.

Governance and Management Structured

In this principle, COBIT 5 makes a clear distinction between governance and management since governance and management are two disciplines with different activities that serve different purposes. Governace refers to all the means and mechanisms that enable miltiple stakeholders in an enterprise to have organised say in evaluating conditions and options, monitoring complience, performance and progress against plans to satisfy specific enterprise objectives. Management entails the judicious use of means to achieve an identified end.

COBIT is considered for this research because it is recognised wideworld and consists of more than 40 best practices documents for information technology from standard-settings bodies, for both public and private organisations wideworld (IT Governance Institute, 2007a). COBIT helps to bridge the gaps between business risks, control needs and technical issues, and provides good practices across domain and process frameworks and presents activities in a manageable and logical structure (IT Governance Institute, 2007a). Having realised that COBIT provides guidance based on business requirements and the nature of a single organisation COBIT is appropriate in the context of this research because the IT Governance of multi-campuses resulting from the merger of different institutions needs controls that address its unique environment based on best practices. COBIT controls are best suited to guide the process of developing the proposed model and to be used as a base in developing the control specific to the case studied. COBIT 5 principles are further used in Chapter 5 in table 5.6 of this study to support the themes used in framing interview questions to collect data from benchmarking institutions.

3.6.9 Organisational Development Theories

The Organisational Development Theories (ODT) were originated from the action research in 1940 by explicitly emphasising the practice and scholarship of planned organisational change (Borman, Ilgen, & Klimoski, 2004). One may ask why are ODTs important? According Kezar (2001) ODTs are important because they are helpful for assessing change by reveal why change occurs (the driving forces of change), how change will occur (the stage, scale, timing, and process characteristics), and what will occur (the contents of change, outcomes, and ways to measure it). McLean (2005) indicates that OD is a complex field which is based on different desired outcomes . Following are identified outcomes but not limitted to the list:

- Advanced organisational renewal

- Engage organisation culture change

- Enhance profitability and competetiveness

- Ensure health and well-being of organisations and employees

- Facilitate learning and development

- Improve problem solving

- Increase effectiveness

- Initiate and /or manage change

- Strengthen systems and process improvement

- Support adaption to change

Due to the complexity of organisational development, different theories/models of change have been established. According to Van der Poole and Poole (1995) as sited by McLean (2001), Borman and Ilgen (2001) and Kezar (2005) there are four ideal organisational development theories of change. These four theories of change are labeled as life cycle, evolution, dialectic and teleology. Each motor can be understood within their generative mechanism (motors) or in a combination of motors.

a. The teleological motor

The teleological motor describes organisational change as the result of purposeful social construction by organisation members. It is found in most contemporary theories of organisational change. The invention of new theories of change have adopted teleolgical motor. There are a number of teleological theories that have emerged during the prior decade such as:

- strategic change that sought to understand the role of leadership in generating organisational change. It address the planned change which is triggered by goal-orienteted managers in both organisation and its environment, cognitive framing theories that

- Cognitive framing theories emphasis on reconceptualisation of the context that leads to further cognitive chage in a continuing iterative process.

- Theories of innovation which focuses on an individual innovation coupled with environmental characteristics to generate organisational change.

b. Evolutionary Motor

Evolutionary motor focuses on change in a given population over time and involves a continuous cycle of variation, selection and retention. These theories focuses on environmental conditions that create inertial pressures for organisational change.

c. The Life Cycle Motor

These models share many assumptions with evolutionary models in terms of adaption and systems approach. The life cycle motor envisions change as a progression through a predetermined sequence of stage. Life-cycle or development

d. The Diatectic Motor

The dialectic motor describes organisational change as the result of conflict between opposing entities. This motor builds from Hegelian process of a thesis and antithesis coming into direct conflict. The dialectic motor often drives cornitive and political change theories and plays a prominent role in schematic change theories and communicative change models..

The organisational development theories are more relevant for this study since they address the concept of change in different areas and levels of the organisation. IT Governance strategic alignment model at WSU is proposed to bring change in the university for the purpose of achieving the university goal. The organisational development theories can be a briliant guiding tool for the implemantion of the proposed model.
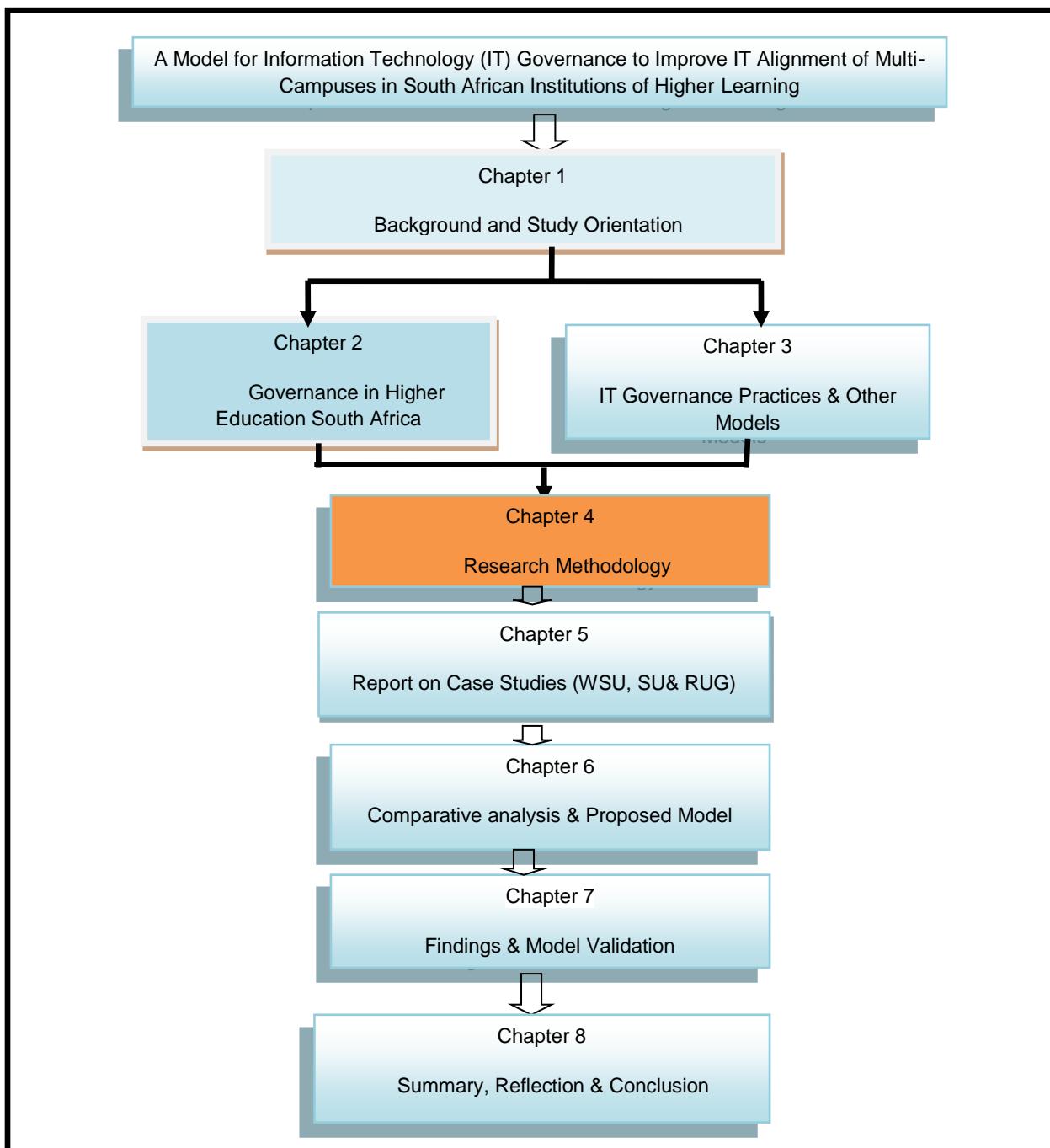
3.7   Chapter Conclusion

Business-IT strategic alignment is an issue of concern for public and private organisations. Literature has indicated that business-IT strategic alignment can be achieved when business and IT units both work together in defining the organisation strategies. The successful definition of business-IT strategies starts with a clear understanding of the organisational goals, vision and mission by business and IT managers. The collaborative effort of business and IT managers will guarantee the effective use of IT strategic alignment in the organisation. In the event that there is no direct interaction of business and IT managers when describing the business strategies, the exercise of improving business-IT strategic alignment in the organisation is likely to fail.

This chapter described a generic concept of IT Governance in the public and private sector. Different business-IT strategic alignment maturity assessment models that will be used for the case of this research were described for the purpose of highlighting their relevance to this research. The business-IT strategic alignment maturity assessment is used as a roadmap for a specific organisation because there is no single approach to strategic alignment that can be effectively used for different organisations because different organisations have different objectives. The business-IT strategic alignment maturity assessment model will be used as guide in developing an IT Governance strategic alignment model specific to this research. The

following chapter will define the research method used in achieving the development of the proposed IT Governance strategic alignment framework for this research. The ideas raised in this chapter are used in Chapter 6, where the proposed WSU proposed model is developed. An understanding of this chapter also helped in identifying the research methodologies used to develop an IT Governance model. The research methodologies are explained in Chapter 4.

Chapter 4: Diagram Overview

A Model for Information Technology (IT) Governance to Improve IT Alignment of Multi-Campuses in South African Institutions of Higher Learning

Chapter 1

Background and Study Orientation

Chapter 2

Governance in Higher Education South Africa

Chapter 3

IT Governance Practices & Other Models

Chapter 4

Research Methodology

Chapter 5

Report on Case Studies (WSU, SU& RUG)

Chapter 6

Comparative analysis & Proposed Model

Chapter 7

Findings & Model Validation

Chapter 8

Summary, Reflection & Conclusion

Chapter 4: Research Methodology

4.1   Introduction

The purpose of this chapter is to provide an overview of the research design and methodologies need to answer the research questions and achieve the research objectives. The chapter captures and describes the context of the research philosophy, research design, research approach, data collection methods and data analysis techniques to ensure the reliability and validity of the research. The parts of the research methodology are illustrated in different layers of the research onion process in Figure 4.1 and will be defined further in the relevant sections of the research.
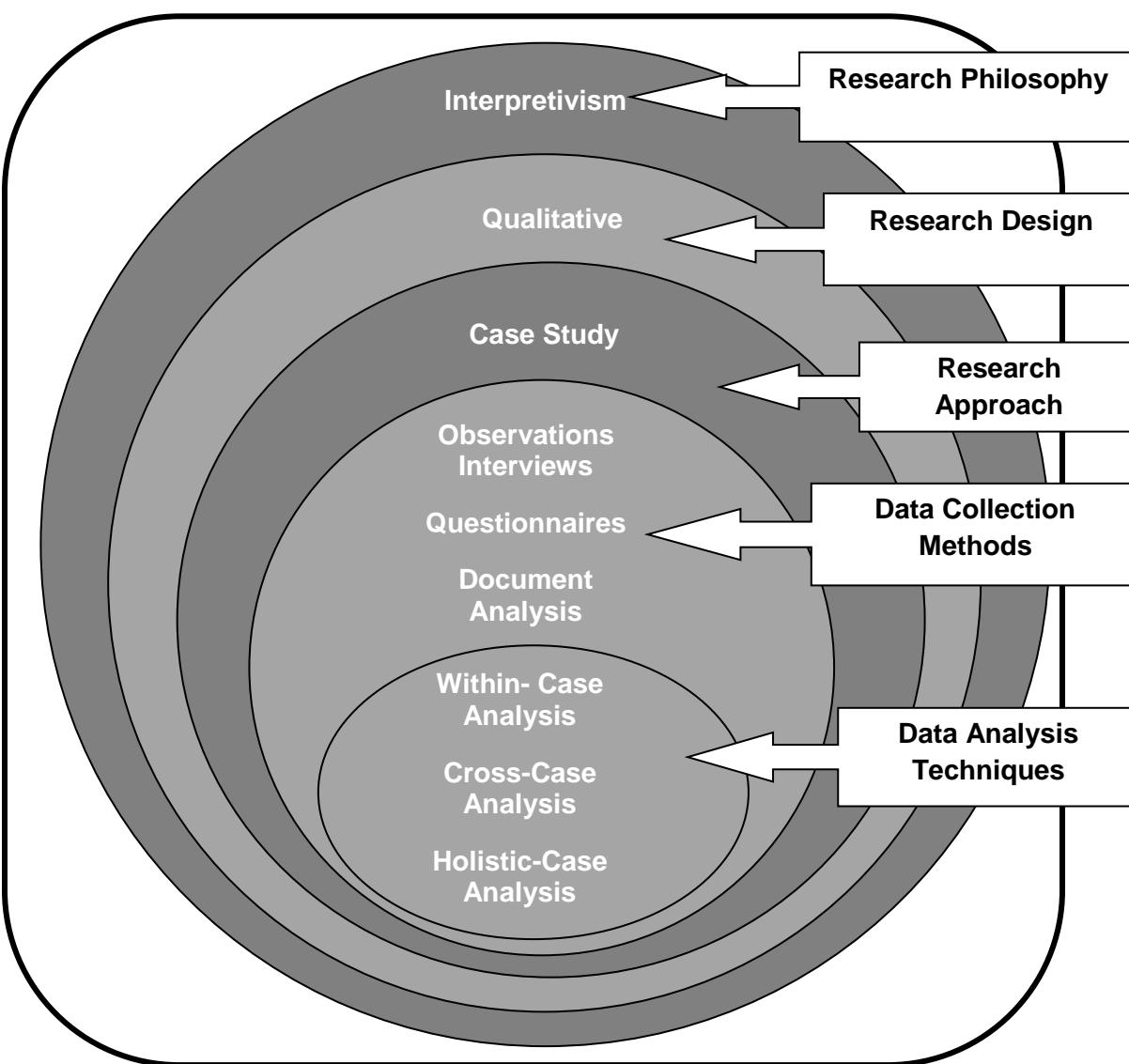
Figure 4.1: Research Onion (Saunders, Lewis & Thornhill, 2009)

The layers of the research onion process as illustrated in Figure 4.1 demonstrate different parts or phases of the research process followed in order to achieve the research objectives. The different parts of the research onion begin peeling off from the outer layer of the onion to the centre. The outside layer which refers to the research philosophy is fundamental to the research process because it enables the researcher to clarify the overall research strategy to be used and further describes a belief about the way in which the data of a phenomenon should be gathered, analysed and used (Flowers, 2009). The stages of the research, as presented in the layers of the onion, and the summary of the chapter are discussed in the following sections.

4.2   Research Philosophy
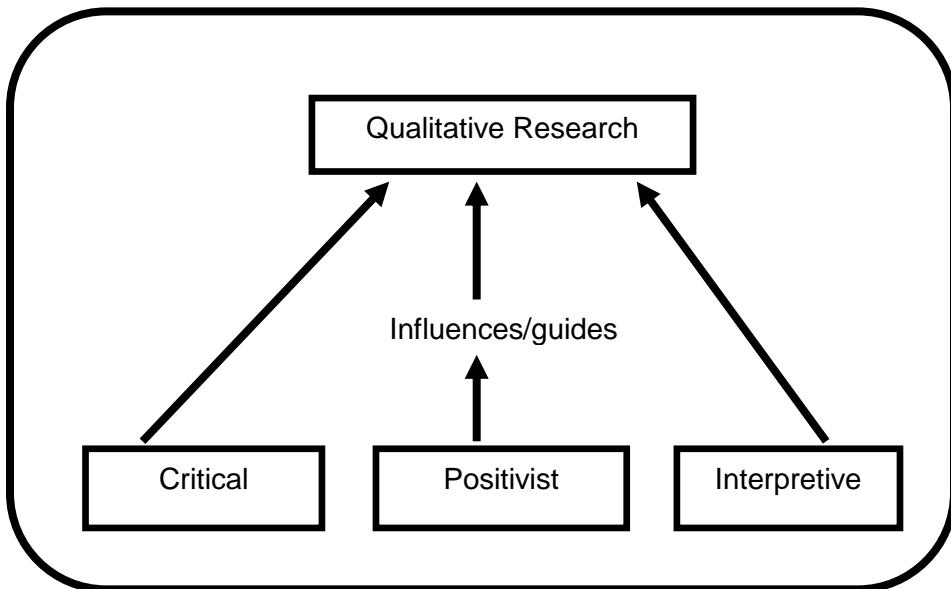
In the field of Information Systems, a wide range of research strategies within different underlying philosophical paradigms have been used to understand the use of information systems (Oates, 2006, Saunders, Lewis, & Thornhill, 2003). This therefore highlights why it is important for Information Systems researchers to familiarise themselves with different philosophies. Saunders, Lewis, and Thornhill (2009) present a research onion model consisting of various layers, in which the first layer consists of philosophies and they regard this as important because it defines the way forward when embarking on research that develops knowledge in a particular field. However, this study was conducted from an interpretivist philosophy perspective its orientation and general guidance was sourced from different literature resources and is discussed further in section 4.2.3.

As highlighted in section 4.1, research philosophy is the concept of how data concerning a phenomenon should be gathered, analysed and used. However, it also:

- Helps the researcher to refine and specify the research methods to be used in a research project, that is, to clarify the overall research strategy to be used. This would include the type of evidence gathered and its origin, the way in which such evidence is interpreted, and how it helps to answer the research questions posed.

- Enables and assists the researcher to evaluate different methodologies and methods and avoid inappropriate use of research methods and unnecessary work by identifying the limitations of particular approaches at an early stage.

- Helps the researcher to be creative and innovative in either selection or adaptation of methods that were previously outside his or her experience.

Saunders *et al.* (2009) have identified ten philosophies in their research onion model; however, Oates (2006) and Creswell (2009) have identified three philosophies which they regard as the

most relevant for research in Information Systems, namely positivism, interpretivism and critical research. Myers (2008) further indicates that every research can be classified under each category of philosophy as identified by Oates (2006). The three philosophical assumptions are illustrated in Figure 4.2.

Figure 4.2: Philosophical assumptions (Myers, 1997)

The philosophical assumptions illustrated in Figure 4.2 are described in the following sections.

4.2.1   Critical Philosophy

Findlay (1975) indicates that critical philosophy accepts that experience enables single substance to acquire knowledge of impression by testing the differences between elements affected by the contrast between subjective and objective. The Critical Philosophy focuses on analysing and criticising the aspect of power that leads to unequal power relations by shaping the unequal power relations to become more equitable (Henning, van Rensburg, & Smith, 2004). Critical researchers focus on positive aspects of power instead of focusing on the negative aspects so that they can guide people in shaping their lives through positive actions and critical thinking. According to Myers (2008), Critical Philosophy is similar to interpretive research except that critical research:

- Focuses on the analysis of the dominant social conditions and systems limitations

- Considers the complex relationships between human interests, knowledge, power and customs of social control

- Challenges the group of dominating assumptions and social practices, and

- Instils an ethically-based attitude which suggests individual liberation and/or improvement in society.

Due to the political and human-power relationship aspect of the Critical Philosophy, it does not support the purpose of this research.

4.2.2 Positivist Philosophy

The positivist position is derived from the basis of natural science and is not learnt from experience, but maintains that valid knowledge is captured from observations and measurements of realities, otherwise knowledge beyond that is impossible (Eriksson & Kovalainen, 2008; Henning, van Ransburg & Smith, 2004; Saunders, Lewis & Thornhill, 2009). Positivist assumptions or rules focus more on quantitative research rather than qualitative research, because its main focus is on quantifying its results from observable and measurable social realities. The results captured from positivist research are almost similar to those produced by physical and natural science which mostly progress to statistical analysis (Saunders, Lewis, & Thornhill, 2009). Characteristics of a positivist philosophy are described by Creswell (2009) indicating that a positivist philosophy:

- Holds a deterministic philosophy that has grounds to determine, identify and assess the influence of outcomes found in the experiment;

- Has a reductionism factor because it reduces a research idea into a small discrete set of ideas to test, such as the variables that comprise hypotheses and research questions;

- Focuses on empirical observation and measurement in discovering the world by developing numeric measures of observations and researching the behaviour of individuals;

- Embraces the theory verification way of doing research because the positivist researchers' first stage in conducting a research starts by testing or verifying and refining a theory before engaging in other processes of research; and

- Believes that a researcher in positivist research should be detached from the research, but stay as an observer of the objects of the research, meaning that a researcher should always be objective and neutral in discovering the facts about the research.

Positivist philosophy consists of good characteristics in pursuing research howeverbecause it fails to consider the human factors, it is not relevant for this research because part of the

proposed model for this research is composed of constructions by human actors. This philosophy may therefore offer no contribution to this research.

4.2.3 Interpretive Philosophy

According to Washman (2006), interpretive research methods are a social construction by human actors where data is composed of our own constructions of other people's constructions of what they and their compatriots are engaged in. The beauty of intepretivism research is that it does not predefine the dependent and independent variables, but focuses on the complexity of human sense contribution such as people's intention, beliefs, values and reasons, and self-understanding as the need surfaces (Henning, van Rensburg & Smith, 2004; Creswell, 2009). This allows a researcher to look at different places and different things in the process of understanding the phenomenon. According to Butler (1998); Klein and Meyers (1999); de Villiers (2005); Walsham (2006), and Saunders, Lewis, and Thornhill (2009), intepretivist research has become much more important in the field of Information Systems in helping Information Systems researchers to understand human thoughts and actions in social and organisational environments and to understand the level to which information system processes influence the environment and vice versa. This indicates that the main role of a researcher who is conducting intepretive research is to understand the differences between humans in their roles as social actors in accordance with the definitions we give to these roles.

Hermeneutics theory has been advocated as an effective, valid and relevant intepretive approach to carry out developmental research in the field of Information Systems, because it is defined as the theory or philosophy of the intepretation of meaning (Butler, 1998). Hermeneutics intepets the text from the point of view of its author, a text being any document in different forms. Butler (1998) further indicates that text analogues such as social actors' behaviour can be interpreted in much the same way as text. Madison (as cited in Butler 1998) indicates that intepretive researchers are challenged regarding their interpretaion of phenomena, especially because collection and analysis of data involves the researcher's own subjectivity. To address subjective researcher challenges in collecting and analysing data Butler (1998) adopted Madison's methodological principles for the intepretive process because Madison believes that the principles are designed to help researchers carry out the complex task in achieving good judgements or conclusions reached through subjective notions. Madison's principles are described in Table 4.1. Madison's principles are also known as intepretive principles of the hermeneutic methods. Eriksson and Kovalainen (2008) indicate that the term intepretivism is often used for hermeneutics, supported by Butler (1998) who states that hermeneutics is a

philosophy or theory of intepretation of meaning. Due to its resonance to epistemological developments in confirming that there is an ultimate dfference between natural science's and social science's subject matter, hermeneutics theory and intepretivism are used interchangably in this research.

Table 4.1: Methodological Principles for the Interpretive Process (Butler, 1998)

Methodological Principles for the Interpretive Process	
Coherence	The interpretation of a text or phenomenon/actor's 'thought' must present a unified picture and not be contradictory.
	The interpretation of IT Governance Strategic alignment is consistently defined and interpreted throughout the cases studied for the purpose of developing a proposed IT Governance Strategic alignment model for WSU.
Comprehensiveness	Interpreting a text or an actor's perspective on an issue must take note of the author's/social actor's 'thoughts' as a whole, and not ignore other relevant 'thoughts'.
	The interpretation and development of the IT Governance Strategic alignment model for WSU will be informed by the collective interpretation of the researcher's opinion together with expert opinion and input from the benchmarked universities.
Penetration	A good interpretation should be 'penetrating' in that it brings out a guiding and underlying intention in an author's/actor's actions: this is indicative of a teleological (research of design) dimension to the hermeneutic method.
	The interpretation of the case scenario through literature research and data collection using different methods such as document analysis, observation, and interviews will enable the researcher to see different actions of the case that will fully inform the researcher's intention of developing a proposed IT Governance Strategic alignment for WSU.

Methodological Principles for the Interpretive Process	
Thoroughness	A good interpretation must attempt to answer or deal with all questions it poses to the interpreted phenomenon, or those that the phenomenon/social actor poses to the researcher. The best practices/ theories (such as Luftman maturity assessment) are used to assist the researcher to understand and carefully interpret the case so as to provide and inform answers to all research questions..
Appropriateness	To be considered a good interpretation, the questions the interpretation deal with must be ones that the text/phenomenon itself raises. Data collection methods are used, which are fully supported by the experts' view that enables the researcher to address the relevant and correct questions concerning the research.
Contextually	The text/phenomenon/actor's thoughts must not be read out of context, without giving attention to their historical and cultural context. The researcher, being part of WSU and of the document analysis of different cases, allowed the researcher's thoughts to remain in context of the cases under consideration.
Agreement 1	An interpretation must agree with what the text/actor actually says; that is, one must not say that the real meaning of what a text/actor says is something other than what she/he actually says. In this research it relates to credibility and validity of the data which is analysed in all relevant case studies. The data have to reflect the intended meaning.

Methodological Principles for the Interpretive Process	
Agreement 2	A given interpretation should normally be in agreement with the traditional and accredited interpretations of text or phenomenon. Based on best practices used as a reference to carry out this research, the interpretation of text for the case was used within acceptable standards of data interpretation.
Suggestiveness	A good understanding will be 'suggestive' or fertile in that it raises questions that stimulate further research and interpretation. Having carried out one component of an IT Governance cycle, the results of this research should stimulate further research.
Potential	A given interpretation can be judged to be true if, in addition to meeting the above requirements, it is capable of being extended so that the process by which it is reached it unfolds harmoniously. This study is supported by the methodological principles for the intepretive process which leads to an assumption that this study has potential to achieve its goal of developing a proposed IT Governance model.

The methodological principles for the interpretive process are found to be very useful for this research, because these principles enable the researcher to be aware of key principles during an interpretive research. These principles further enlighten the researcher about the process of identifying the relevant and important components that will effectively contribute to effective and stimulating research results. The link of each component of the principles outlined in Table 4.1 serves as a checklist for the researcher in the process of achieving the purpose of this research; hence an interpretive philosophyhas been adopted for this research.

Interpretive philosophy interprets the complex reality of the ongoing acts of social research or research idea; hence the principles described in Table 4.1 support and assist researchers to reach the interpretation depth of the phenomenon and its components. The usefulness and need for these principles are identified by Butler (1998) and Walsham (2006) who indicate that interpretive researchers are involved in the difficult task of accessing other people's interpretations, filtering them through their own conceptual apparatus, and feeding a version of

events back to others including in some cases, different interviews and other audiences guaranteeing the need for such principles.

The proposed IT Governance model in this research is developed based on the comparative analysis of other institutions' IT Governance using existing best practices. An Interpretivist philosophy is the best philosophy for this research because the literature on information systems development within organisations indicates that an interpretive approach to research on the development process is most appropriate for the research of phenomena (Butler, 1998). The preferred philosophy assists the researcher in understanding important assumptions within the world of research. The assumptions learnt from the philosophy underpin the proposed research strategy and the methods used as part of the strategy.
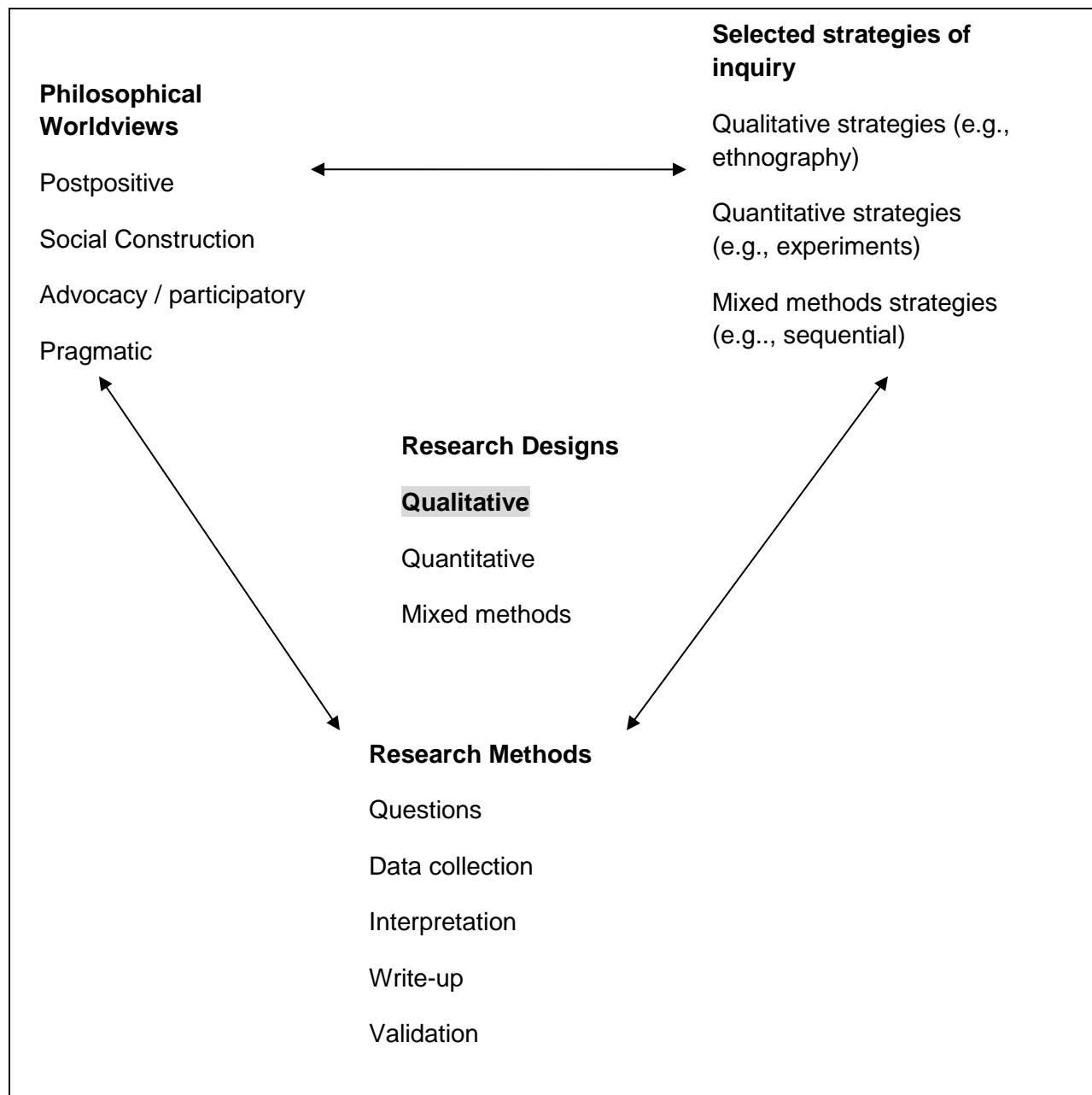
The preferred philosophy supports the purpose of this research, which is to create a rich understanding of possible IT Governance strategic alignment models that address the unique needs of Walter Sisulu University. It is different because the WSU merger created an environment completely different from other institutions of higher learning in South Africa. This philosophy enabled IS researchers to understand the context of Information Systems and the process in which Information Systems influences the institution's activities; Information Systems is also influenced by the context of the institution (Klein and Meyers, 1999), where IT strategies are developed as part of the university strategy and further address the needs of the university's vision. Interpretive research is used to identify, explore and explain how all the factors in the WSU environment are related and interdependent in an effort to create a rich understanding of its unique contexts (Saunders, Lewis & Thornhill, 2009), hence interpretive research is relevant for this research. Section 4.3 discusses a few research designs including the one which this research will pursue.

4.3   Research Design

Research design is the descriptive starting point after a problem has been identified. It describes what and how to achieve the research objectives. Research design is a plan, structure and strategy of investigating conceived assumptions so as to obtain answers to research questions and to control variance. According to Creswell (2009), a research design involves the following:

- A plan covers the outline of the research scheme in conducting research

- The structure defines a specific scheme of the research work, and

- A strategy suggests how the research will be carried out.

The research design is considered to be more than a description of the starting point of research, but a specification of methods and procedures for acquiring information needed (Strauss & Corbin, 1998; Creswell, 2009). Approaches to research design vary according to the nature of the disciplinary origins. Mayoux (2005) indicates that the research design is conventionally divided into qualitative, quantitative and participatory methods each with differing underlying approaches, tools and techniques. However, Creswell (2009) highlights that the third advanced research design, over and above qualitative and quantitative, is mixed methods. There are three conponents involved in a design, namely philosophical assumptions, distinct methods or procedures and strategies of inquiry (Creswell, 2009). The interaction of these three components is illustrated in Figure 4.3. The components involved in the research design show the interelated levels of decision-making that go into the process of designing a research project, informing a choice of approach ranging from broad assumptions brought to the reseach to more practical decisions made about how to collect and analyse data. The work of Creswell (2003), Henning (2004), de Villiers (2005) and Creswell (2009) confirms that research does not take place in a methodological vacuum, but is established in planning research by thinking through the philosophical paradigm assumptions contributing to the research, the strategy of inquiry related to the paradigms and the methods of research that translate the approach into practice. These authors emphasise the importance of considering the design components depicted in Figure 4.3 when starting the research.

Philosophical Worldviews

Postpositive

Social Construction

Advocacy / participatory

Pragmatic

Selected strategies of inquiry

Qualitative strategies (e.g., ethnography)

Quantitative strategies (e.g., experiments)

Mixed methods strategies (e.g.., sequential)

Research Designs

Qualitative

Quantitative

Mixed methods

Research Methods

Questions

Data collection

Interpretation

Write-up

Validation

Figure 4.3: A Framework for Design – The interconnection of Worldviews, Strategies of Inquiry, and Research Methods (Creswell, 2009)

Qualitative research design focuses more on process rather than products, and is interested in finding out how people make sense of their lives, experiences and their structure of the world, whereas quantitative research focuses more on measurements, quantifying numbers and mainly using the predifined acceptance concepts (Creswell, 2009; Henning, 2004). Mixed methods is an approach that combines or incorporates both qualitative and quantitave forms.

Creswell (2009) summarises qualitative, quantitave and mixed methods approaches in Table 4.2.

Table 4.2: Qualitative, Quantitative and Mixed Methods Approaches (Creswell, 2009)

Tend to or Typically….	Qualitative Approaches	Quantitative Approaches	Mixed Methods Approaches
Use of these philosophical assumptions	Constructivist/advocacy/ participatory knowledge claims	Post-posivist knowledge claims	Pragmatic knowledge claims
Employ these strategies of inquiry	Phenomenolgy, grounded theory, case studies, and narrative	Survey and experiments	Sequential, concurrent, and transformative
Employ these methods	Open-ended questions, emerging approaches, text or image data	Close-ended questions, predetermined approaches, numeric data	Both open and closed-ended questions, both emerging and predetermined approaches, and both quantitative and qualitative research
Use these practices of reseach as the researcher	Position him/herself Collect participants meaning Focuses on a single concept or phenomenon Bring personal values into the research Studies the context or setting of participants Validates the accuracy of findings Makes interpretaions of the data Creates an agenda for change or reform Collaborates with the participants	Tests or verifies theories or explanations Identifies variables to research Relates variables in questions or hypotheses Use standards of validity and reliability Observes and measures information numerically Use unbiased approaches Employ statistical procedures	Collects both quantitative and qualitative data Develops a rationale for mixing Integrates data at different stages of inquiry Presents visual pictures of the procedures in the research Employs the practices of both qualitative and quantitative research

Table 4.2 highlights characteristics that define each type of research design that can be used in planning the procedure of conducting research. The summary of different research designs as captured in Table 4.2 further creates a clear distinction that assists in identifying the relevant philosophy, strategies of enquiry and research methods. The qualitative research design has been adopted for this research because this research is looking at procedures and how relevant structures of an institution makes sense of their IT Governance and further suggests how it can be improved. This research will also apply a multiple-case study as methodology which is a

qualitative research method. Interviews will be conducted with different participants at the selected HEIs. The research is conducted by the researcher and meanings are collected through case studies from participants. The qualitative approach is described in detail in section 4.3.1.

4.3.1 Qualitative Approach

A qualitative approach to research produces findings not arrived at by means of statistical procedures or any other means of quantification, but involves an inquiry of understanding based on a distinct methodological tradition of inquiry that explores a social or human problem (Strauss and Corbin, 1998; Neill, 2006; Oates, 2006; Neill, 2007). The strength of qualititive research is that it does not follow any fixed woven plan but allows for deviations and suprises during the research process. However, researchers should recognise key elements that should be planned for beforehand (Eriksson & Kovalainen, 2008). Because of its unstructured approach, it therefore can collect considerable amounts of raw data that need to be managed effectively during the analysis phase. Thomas (2003) indicates that literature has documented underlying assumptions and procedures associated with analysing qualitative data. These procedures are associated with specific approaches or traditions which are not clear to qualitative researchers. Thomas (2003) has identified an inductive approach as a straightfoward unlabelled approach which can be easily undestood by researchers. Thomas (2003) further indicates that the purpose of an inductive approach in qualitative data analysis is to condense extensive and varied data into a brief summary format and:
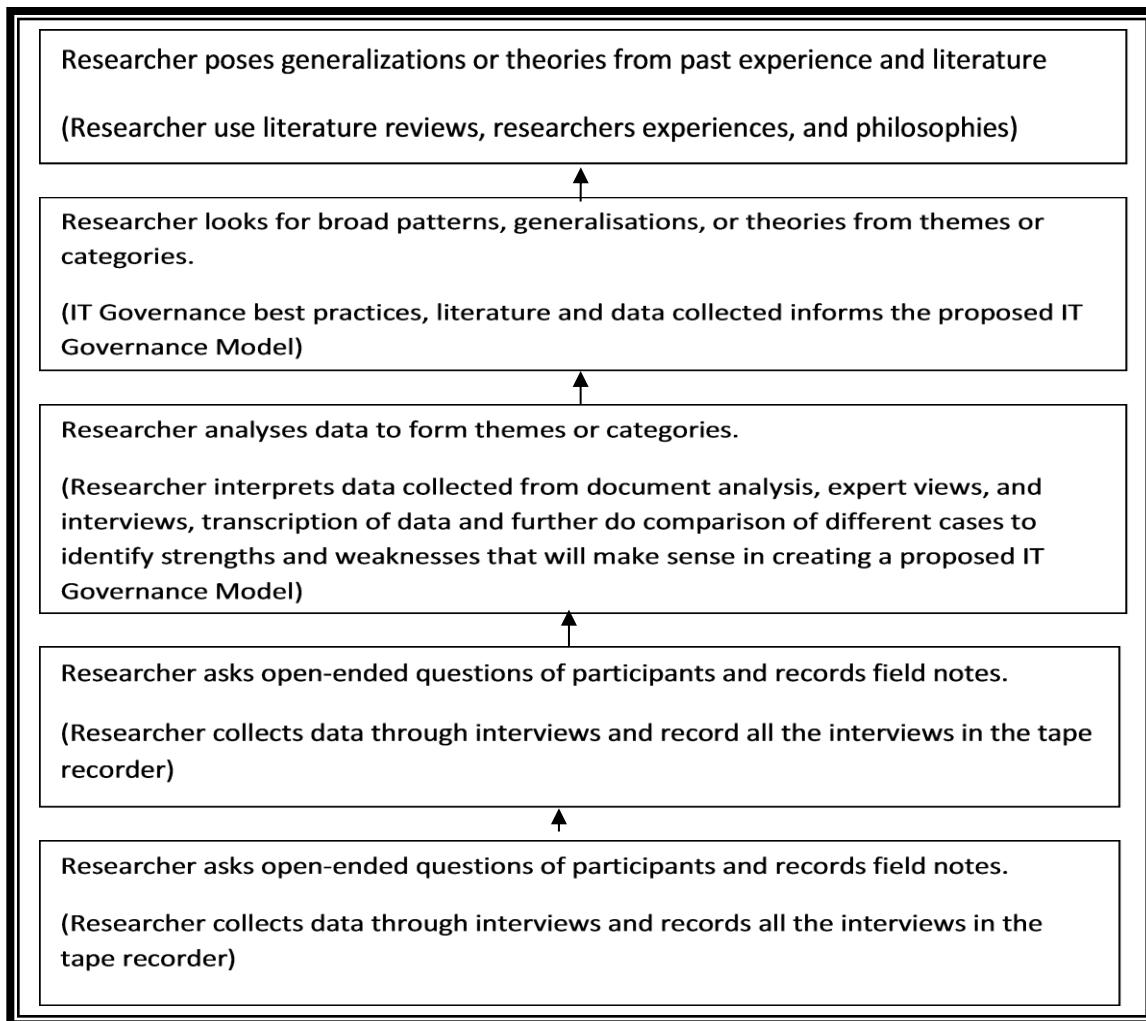
1. Establish clear links between the research objectives and the summary findings derived from the raw data, and

2. Develop a model or theory about the underlying structures of experiences or processes which are evident in the raw data.

This indicates that the inductive approach provides an easy and systematic set of procedures for analysing qualitative data that produces reliable and valid findings.

An inductive approach best defines this research, and hence the researcher has borrowed and used the inductive logic of research in qualitative research as the research design process because this theorical oriantation supports the logic used to carry out her research. The inductive process builds up from the data to broad themes to a generalised model or theory. The logic of the inductive approach is depicted in Figure 4.4. Eriksson with Kovalainen (2008) expand Creswell's definition of the inductive approach by indicating that inductive reasoning
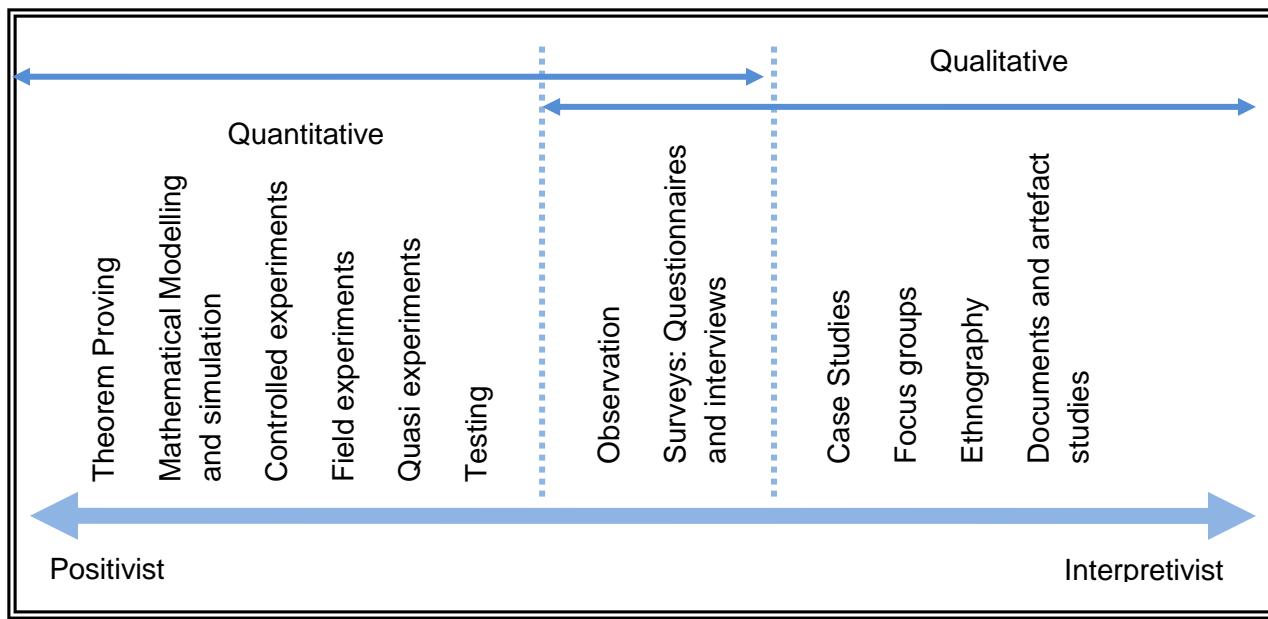
draws from observed cases, addressing general claims about most cases of the same kind. The inductive approach follows the logic of processing from empirical research to theoretical results. Most researchers have identified this approach as deficient because they see the theory as an outcome of the empirical research, not prior to it. However, theories have been identified as corrective modes concerning findings; hence this approach has gained a firm foothold (Eriksson & Kovalainen, 2008).

As described in Figure 4.4, the research process started from gathering data through different types of data collection methods in section 4.5, recording the collected data, and performing comparisons from the three institutions of higher learning identified for this research, based on best IT Governance best practices. Finally, this research lead to an IT Governance Strategic Allingment Model suitable for WSU that will be used as a corrective model for the challenges identified at WSU. There is a considerable difference between the terms model and framework however they are often used as synonyms. According to Tomhave (2005), a model is an abstract, conceptual construct that represents processes, variables, and relationships without providing specific guidance on or practices for implementation, whereas a framework is a fundamental construct that defines assumptions, concepts, values, and practices, and that includes guidance for implementatiion itself. This definition of a model supports this study very well since its main objective is to provide a general guidance for achieving a goal of developing a model that will enable WSU to enhance its IT Governance by representing a new phenomenon that will replace an existing IT systems without getting into the practices and procedures of implementation. A diagram that represents the constructs and abstract of the model is presented in Chapter 6.

Researcher poses generalizations or theories from past experience and literature

(Researcher use literature reviews, researchers experiences, and philosophies)

Researcher looks for broad patterns, generalisations, or theories from themes or categories.

(IT Governance best practices, literature and data collected informs the proposed IT Governance Model)

Researcher analyses data to form themes or categories.

(Researcher interprets data collected from document analysis, expert views, and interviews, transcription of data and further do comparison of different cases to identify strengths and weaknesses that will make sense in creating a proposed IT Governance Model)

Researcher asks open-ended questions of participants and records field notes.

(Researcher collects data through interviews and record all the interviews in the tape recorder)

Researcher asks open-ended questions of participants and records field notes.

(Researcher collects data through interviews and records all the interviews in the tape recorder)

Figure 4.4: Inductive Logic of Research in Qualitative Research (Creswell, 2009)

De Villiers (2005) describes qualitative research as a naturalistic interpretive science, which is multi-method in focus and uses research methods such as case studies, interviews, observation and textual/document analysis (Creswell, 1998). De Villiers further demonstrates a close relationship between philosophy, research approach and data collection methods. This relationship confirms that intepretivism research is pure qualitative research while positivism is quantitative in nature. This therefore supports the choice of the researcher in this research.

Figure 4.5: Qualitative and Quantitative Approaches (De Villiers, 2005)

Figure 4.5 demonstrates an overview of qualitative and quantitative research methods with the respective data collection instruments, by showing where they overlap and so can be used in both qualitative and quantitative research. The overlaping components of qualitative and quantitative clearly support why the researcher has adopted a qualitative approach to this research. Strauss *et al.* (1998) further highlight that there are three major components of a qualitative research approach:

- Data which comes from various sources such as interviews, documents, observations etc.

- Procedures that can be used by researchers to intepret and organise the data, and

- Diffferent types of approaches to conduct qualitative research.

The three components of qualitative approach support this research because various sources of data collection and procedures will be used to reach the objectives of this research (see research approach and data collection methods in sections 4.4 and 4.5 below).

4.4   Research Approach

Creswell (2009) indicates that the qualitative research approach has various strategies of inquiry, including case research, narrative research, ethnographies, etc. These strategies vary according to the nature of the inquiry. Case research is also defined by different authors as a qualitative approach in which the researcher explores a case or multiple cases over time through extensive data collection that involves multiple sources of evidence (Dube and Pare,

2003; Darke, Shanks, and Broadbent, 1998; Creswell, 2007). This research study opted for a case research investigating of how the phenomenon of IT Governance Strategic Allignment can be improved in the context of any institution of higher learning, that is Walter Sisulu University and two other benchmarked institutions, based on best IT Governance practices (as the other two case studies). One benchmark institution will be within the international context and another one within the South African context, and are real-life cases involving multiple sources of data collection methods. Case research as a research approach is described in-depth in the next section.

4.4.1 Case Research Approach

Case research is a holistic inquiry that investigates an existing phenomenon within its natural settings (Yin, 2009). According to Mord-Noor (2008), case studies focus on how and why things happen, and allow the investigation of contextual realities and the differences between what was planned and what actually happened; however, it is not intended to investigate the whole organisation but it looks at the specific issue, feature or unit of analysis (Dawidowicz, 2011).

Dube *et al.* (2003) further indicate that case research:

- Combines several data collection methods such as interviews, documentation and observations, but can also include quantitative data such as a questionnaire and time series (Yin, 2009)

- Gained respect in the Information Systems field, because it is particularly well-suited to information systems research, since the object of this discipline is information systems in organisations, where interest shifts to the organisation rather than to technical issues

- Has access to and reports on real-life IT experiences; case researchers allow both academia and practice to keep up with rapid changes occurring in the world as well as in organisations

- Is a holistic investigation which represents a key characteristic of case research, and suits our need well to understand the complex and ubiquitous interaction among organisations, technologies and people

- Has access to the use of a wide range of data collection methods bringing richness and flexibility to the overall research process, making case research particularly well designed for the research of a complex phenomenon such as information technology (Yin, 2003), and

- In-depth case investigation opens a way to new ideas and new lines of reasoning and pinpoints the opportunities, challenges and issues facing IT specialists and managers.

Baxter and Jack (2008) suggest that a researcher should determine the type of case research to be used for a research pursuit when a qualitative case research has been identified as the best approach to answer the research questions. The work of Creswell (2007, 2009), Yin (1994), Harling, (2002) and Darke, Shanks, and Broadbent (1998) indicate that there are two different types of case studies, namely, single and collective case studies. Creswell (2007) and Harling (2002) report that single case research consists of an intrinsic and instrumental case research. The intrinsic case research focuses on one unique issue of concern whereas the instrumental case research provides a general understanding of an issue using a particular case. The collective case research is also known as a multiple case study; it focuses on one issue or concern using multiple case studies to convey the issue. The purpose of multiple cases is to replicate findings so that the researcher can draw an informed comparison between the cases. It is important that the researcher provide a rationale for the cases used. Multiple case study is embraced for this research because the study is carried out into three different institutions of higher learning.

Morra and Friedlander (n.d.), Schell (1992), Yin (2003) and Baxter and Jack (2008) further highlight that case studies can be classified into different categories such as descriptive, explanatory and exploratory. The nature of each category is closely related to the research question(s) it answers.

- Descriptive case studies mainly describe the phenomenon and the real-life context in which it occurs by describing what is happening and why in order to demonstrate the situation. It focuses mainly on questions such as what, why and where.

- Explanatory case studies excel in answering why and how research questions, and it typically uses a purposive sample. Regarding the evaluation of concerns, explanatory case studies could be used to answer questions that presume causal links in real-life interventions but that are too complex for survey or experimental strategies. They seek to check if projects were implemented as intended or designed, and to identify the problems experienced by looking at the measures implemented and why. Their purpose is to identify the strengths and weaknesses of a project for the purpose of learning from them and applying the lessons learnt to other projects. This represents a diversity of the best and worst cases.

- Exploratory case studies focus mainly on research questions such as how many or how much, who, where and what, which favour the survey type of research. They are condensed case studies undertaken before a large scale investigation is implemented. Their basic function is to assist in identifying questions and selecting the type of measurement prior to the main investigation.

The explanatory case study is adopted for this research because purposive samples have been used to collect data and the research answers mainly the why and how research questions. Cases used for benchmarking are studied to identify their IT Governance strengths and weaknesses so that the researcher can borrow from her experience in the process of developing a proposed model for WSU. Creswell (2009) states that case studies are activity driven and have limited time to achieve their purpose; hence researchers use different data collection procedures to organise and conduct the research effectively. Soy (2006) has drawn up six steps of data collection procedures based on the research of well known case studies. The steps of data collection procedures for a case study research are described in section 4.4.1.1.

4.4.1.1 Procedures for Conducting a Case Study Research

Table 4.3: The six steps of data collection procedures in case research as described by Soy (2006)

Steps of data collection	Description of the steps of data collection
Determine and define the research question	The first step in the case research establishes a firm research focus used as a reference over the research period of an issue or object.
Select the Cases and Determine Data Gathering and Analysis Techniques	During the design phase of a case research, the researcher identifies the best approach selecting either single or multiple real life case/s and examines them in-depth and then identifies the appropriate data gathering instrument to be used. Where multiple cases are used, each single case is treated as a single case and the conclusion of the case is used as a contribution to the whole research.

Steps of data collection	Description of the steps of data collection
Prepare to Collect Data	Case research collects data from multiple sources resulting in the generation of large amounts of data. To avoid the researcher losing focus, a systematic organisation of data collection is used.
Collect Data in the Field	The researcher should gather and store multiple sources of evidence carefully and systematically, in formats that can be referenced and sorted so that covering lines of inquiry and patterns can be uncovered. The researcher should carefully observe the objects of the case research and identify casual factors associated with the observed phenomenon. Knowing that case studies are flexible, it is therefore very important that when changes are made they are also recorded systematically.
Evaluate and Analyse the Data	The researcher examines data using different interpretations to establish linkages between the research object and the outcomes with reference to the original research questions. The evaluation and analysis process allows the researcher to stay tuned to new opportunities and insight. The multiple methods of data collection and analysis techniques of case studies provide a researcher with opportunities to triangulate data in order to strengthen the research findings and conclusions.
Prepare the Report	The researcher reports case studies in a way that transforms a complex issue into easily understood language and allows a reader to question, examine and understand the research independently without the researcher's help. In the process of preparing a research report, a researcher pays specific attention to displaying sufficient evidence

The data collection procedure described in Table 4.3 justifies case study research as the appropriate approach that effectively contributes to the development of knowledge in this field.

The case research approach is adopted for this research and employs the multiple case study approach using explanatory case research. The researcher looked at three cases addressing the same issue of IT Governance in institutions of higher learning and the investigation was conducted in:

- WSU as the institution of higher learning in South Africa currently experiencing challenges in managing IT Governance alignment

- The benchmarking institution in Southern Africa, which has established IT Governance that is functioning effectively in its environment

- The international benchmarking institution in the Netherlands with advanced IT Governance that works effectively in its environment.

The reason for the above selection is to validate this specific model for WSU as it is based on the best models, both nationally and internationally, where benchmarking of their successes and failures can contribute to the proposed model for WSU. Visiting other universities also allows the researcher to observe current IT structures which are important for the development of the proposed WSU IT Governance model.

Creswell (2007) indicates that important steps for data collection are sourcing participants or a site of the research and gaining access to that site. Creswell's statement emphasises the importance of identifying a case and all relevant components that will contribute to the research. Section 4.4.2 describes how the researcher requested access to the site of research.

4.4.2   Access to the Site of Research
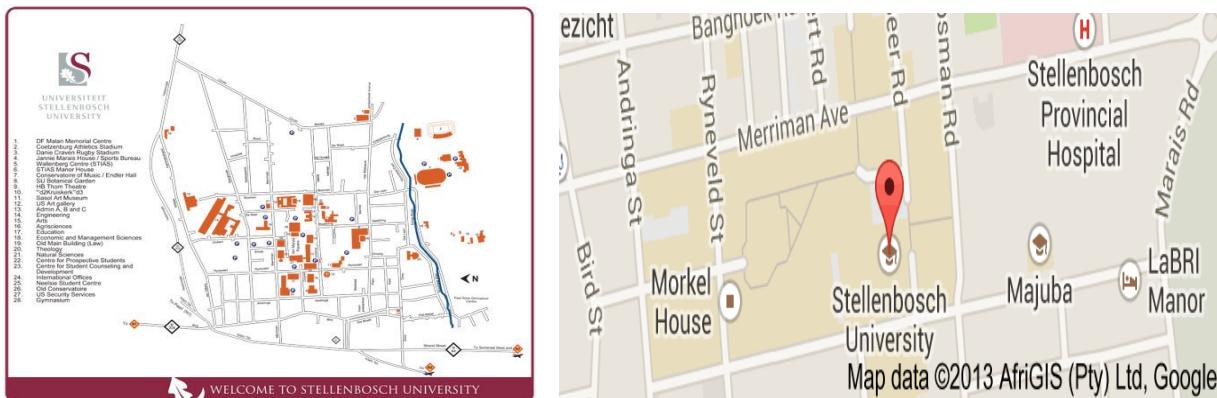
Finding people and/or a place are key factors for a case study research as highlighted by Creswell; hence it is important for a researcher to apply clear action steps . Finding people can be done in several ways, and can be a difficult or easy excercise (Eriksson & Kovalainen, 2008). Access to the site of research is equally as important as the sustainability of the identified people and the place of a research. Eriksson and Kovalainen (2008) further indicate that the issues of access to the site of research are highly important because they are direclty linked to the results of the research. The researcher needs to adhere to a set of controls before gaining permision to enter the site of research. These controls are handled in different offices for different organisations; however, literature refers to the people responsible for these controls as

"gatekeepers" (Creswell, 2007; Eriksson & Kovalainen, 2008). Gatekeepers have the power to allow or deny access permission to the site. In this research; different gatekeepers were approached with formal written request to conduct the research (see Annexure A-1). A liaison person (Communication Information Technology Director) was contacted for the international university and Directors of Research were contacted in the South African benchmark university. Permission from the University of Fort Hare Ethics Committee was granted to conduct this research (see Annexure A-2).

The sites of the research are geographcally dispersed; one is in the University of Groningen in Netherlands, and two in South Africa, WSU in Eastern Cape Province and Stellenbosch University in the Western Cape Province. The site in the Netherlands happened to be a university which has a highly rated IT Governance; however, it worked in collaboration with the institution where the researcher worked. The South African benchmarked university was selected because of its high IT Governance rating in South Africa. The maps of the institutions where data was collected are presented below. The visited sites are marked in red on the maps.

RUG Maps: www.googlemaps.com
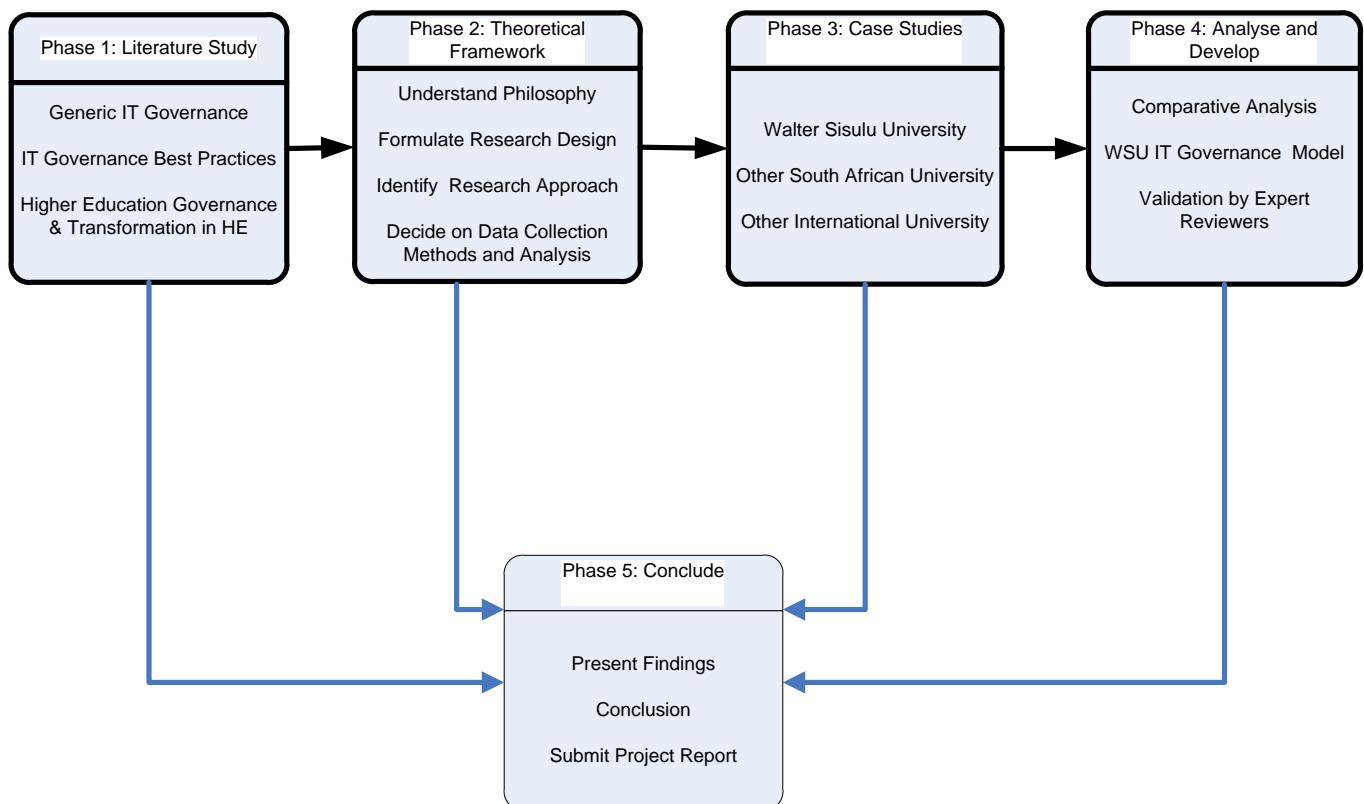
SU Maps: (Google Maps)

Having identified and selected the cases to be studied to achieve the research objectives, the research process was developed and is defined in section 4.4.3.

4.4.3   Research Process

The research process is the summary of the phases that have been followed in achieving the research objectives.
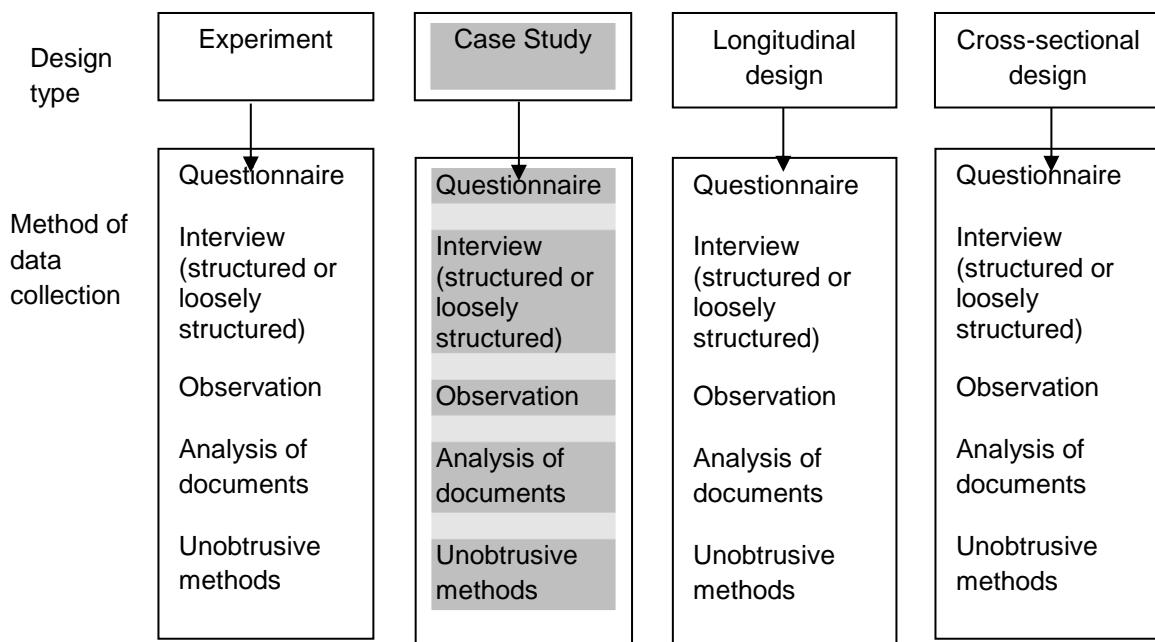
Figure 4.6: Research Design Process (Ngqondi, 2012)

The first phase of the research process was the literature research, which enlightened the researcher concerning the governance structure and restructuring of the systems in institutions of higher learning. The literature on IT Governance maturity assessment captured by different experts in the field assisted the researcher in understanding and conceptualising the basic IT Governance components that contribute the developement of a proposed IT Governance model. Phase one is captured in Chapters 2 and 3 of the research. The second phase described in detail in Chapter 4 of the research is the theoretical framework which outlines and describes the processes of answering the research question for the purpose of achieving the research objectives. The research philosophy, research design and methods of data collection, and data analysis are described in this phase. Phase 3 captures and summarises the findings in each case research that informs the IT Governance model and are captured in Chapter 5 of the research. Phase 4 reports on the comparative analsysis of the findings from the cases studied which leads to the development of the proposed IT Governance model. This phase also leads to the validation of the proposed model, which will be done by expert reviewers. Then finally, Phase 5 presents the final IT Governance model and further concludes the findings of the research. The processes of this phase are defined in Chapter 7 of the research. In order to collect information to address the research questions, specific data collection methods were applied.

4.5   Data Collection Methods

Data collection is a key activity in the implementation of a research strategy, and must be carefully planned to provide information. Each research strategy contains one or more data generation methods (Oates, 2006). It is common that some research methods confuse research design with method which leads to poor evaluation of design; hence it is important to differentiate between a design and a method (De Vaus, 2001). The relationship between research design and particular data collection methods can be identified easily as illustrated in Figure 4.7:

Design type	Experiment	Case Study	Longitudinal design	Cross-sectional design
Method of data collection	Questionnaire Interview (structured or loosely structured) Observation Analysis of documents Unobtrusive methods	Questionnaire Interview (structured or loosely structured) Observation Analysis of documents Unobtrusive methods	Questionnaire Interview (structured or loosely structured) Observation Analysis of documents Unobtrusive methods	Questionnaire Interview (structured or loosely structured) Observation Analysis of documents Unobtrusive methods

Figure 4.7: Relationship between research design and particular data collection methods (De Vaus, 2001)

Figure 4.7 illustrates that design is a logical structure of inquiry and not a mode of data collection. The demonstration is defined by sketching the design types with data collection methods in the different levels. It further demonstrates the relationship between design and methods by the arrows linking the two in a specific order. De Vaus (2001) defines design and method relationships as building projects, where a builder needs to establish the type of the building and its purpose then design a plan and order the material. Therefore, before deciding on the data collection methods, a research design should be identified so that it can answer the questions using the correct source. The evidence for this research will be gathered by applying different types of data collection methods known as a triangulation approach. Multiple sources of data collection steps include the boundaries for the research such as interviews, observation, document analysis and a questionnaire (Creswell 2009; Klein and Meyers, 1999; Key, 1997; Olivier 2009). Interviews, questionnaires, observation, briefing sessions, expert opinion and document analysis as data collection methods are adopted and implemented for this research and are discussed in the next sections.

4.5.1 Interviews

An interview is a kind of planned conversation with the agenda of gaining information from others but does not occur by chance; it has a set of assumptions that do not apply in a normal conversation (Oates, 2006). Interviews are often used to gather detailed, qualification

descriptions of how programmes operate and how stakeholders perceive them (Harvard Family Research Project, 2004; Voce, 2005; Oates, 2006). Interviews are conducted on a one-on-one basis for a targeted group. Interview questions are generally open-ended and responses are documented in detailed notes or transcriptions (Harvard Family Research Project, 2004). For this research the one-on-one interviews were conducted using open-ended questions. All the interviews were recorded and then transcribed (see pool of interviews questions in Annexure A-3).

4.5.2   Questionnaire

A questionnaire is a set of questions that gathers information from individuals using either mail, telephone, face-to-face interviews, handouts, or electronically. Hence, Oates (2006) suggests that it is important to prepare questionnaire and interview questions closely. Oates further indicates that a questionnaire in an effective tool for generating data about the concept you are interested in, known as content validity. Questionnaires offer a very flexible way of quickly collecting large amounts of data from a large number of participants. It can collect information regarding almost anything including usability, user satisfaction, opinion and attitudes. The questionaire for this research was used as a check list tool for the purpose of checking universities' IT components. The questionnaire was submitted to the IT Director during the briefing session. See the questionnaire in Annexure A-4.

4.5.3   Document Analysis

Document analysis enables a researcher to obtain organisational procedures, people, languages and words from different organisational documents (Creswell, 2009). The information obtained from documents can verify and supplement information obtained from other methods of data collection (Oates, 2006). The documents such as the IT strategic plan, IT and IT Governance policies and standards for the three case research institutions were studied for the purpose of checking if they meet the requirements of the general agreed national and international standards and then guided the researcher to identifying the relevant stakeholders for the interview schedule. Other documents such as reports, minutes and circulars were also viewed to learn about the ongoing discussions within the institution regarding the information relevant to the research. The report of the findings of the main case will be informed mainly by the data captured from the document analysis and observation since it has been confirmed by the two interviewed candidates that IT Governance was never deployed at WSU. Findings from the document analysis contributed to the development of the proposed model in this research. According to Voce (2005), document reviews are a useful source for a researcher because they

guide a researcher in the processes of knowing what needs to be investigated further and which is not necessarily covered by other methods of data collection.

4.5.4   Observation

Observation is defined as a method of collecting empirical data through different means such as human, electronic and mechanical (Eriksson & Kovalainen, 2008). Observation consists of different dimensions that describe variations in observational methods (Eriksson & Kovalainen, 2008; Voce, 2005). The variations could be the involvement and focus of the research, duration of observation and the observational approach to the research. These variations are also coupled with what is going to be observed; which in most cases is guided by the research question. Observation can focus on physical settings, textual data, documents, visual materials and observing what does not happen (Eriksson & Kovalainen, 2008; Voce, 2005). In this research the researcher used different observation dimensions to observe the way IT is handled at WSU. The researcher observed mostly at what did not happen and what should have happened if a good IT Governance model had been in place (Voce, 2005). During the site visits, the researcher further observed the physical set up of the computer facilities to validate the feedback captured from document analysis and interviews. Computer laboratories and library computer systems were observed. Historical information within the context of the research was observed by checking how the merger contributed to the success and failure of the organisational IT Governance.

This research used triangulation to provide trusted data and a comprehensive perspective on the issues being studied, which also enabled the researcher to validate and cross-check findings (Voce, 2005; Guion, 2002; Kennedy, 2009). Triangulation is described in section 4.5.5.

4.5.5   Triangulation

According to Rugg (2010), triangulation was established from mathematical roots where it was used to determine the location of a fixed point based on laws of trigonometry. These laws were used to prove that if one side and two angles of a triangle were known, the other two sides and angle could be calculated. In 1970 the mathematical roots of triangulation began to be used as a sociological method and was further accepted as a way to improve the analysis and interpretation of findings from various types of studies.

The trustworthiness of triangulation became effective because it brings together different kinds of evidence into relationships with one another so that the evidence can be compared and contrasted. In comparing different accounts, the points where they differ, converge and diverge

allow insights and new understandings to be developed. Guion (2002) indicates that triangulation is a method used by qualitaive researchers to check and establish valitidy in their studies, which Kennedy (2009) defines as a good tool to minimise problems of bias when conducting qualitative research. According to Denzin (as quoted by Rugg 2010), triangulation brings greater confidence to the observed findings. Thurmond (2001) and Guion (2002) indicate that the combination of two or more data sources, investigators, methodological approaches, and theoretical perspectives within the same research results in different types of triangulation namely: data triangulation, investigator triangulation, methodological triangulation and theoretical triangulation. Rugg (2010) indicates that these different types of triangulation were identified by Denzin in 1978.

- Data Triangulation

Data trianguation involves three data sources, time, space and person, in the research. Data are gathered through different sampling strategies, so different pieces of data are collected at different times in different social situations from different people. Data triangulation improves and increases the validity and reliability of the research because the findings of the research are verified and when there are any weaknesses, they are compensated by the strengths of other data. It therefore strengthens the conclusions about the findings and reduces the risk of false interpretation.

- Investigator Triangulation

Investigator triangulation involves using different researchers or investigators in evaluating research. In order to triangulate, each researcher will conduct the research using the same qualitative method. The findings of each researcher will be compared. This method enhances the credibility of the findings which are identified independently. This approach reduces the level of bias in gathering, reporting and/or analysing research data.

- Theoretical Triangulation

Theoretical triangulation involves the use of multiple theories or hypotheses when examining a situation or phenomenon for the purpose of looking at a situation from different perspectives, through different lenses, with different questions in mind. Different theories in theoretical triangulation may be tested using the same data set. Different theories used within this approach do not need to be the same or compatible. Theoretical triangulation uses people from different disciplines or positions; however, at times it uses people from the same disciplines if they are from different status positions. This approach is time consuming.

- Methodological Triangulation

Methodological triangulation involves the use of multiple qualitative and/or quantitative methods to research the programme. Thurnmond (2001) indicates that Barbour (1998), Greene and Caracelli (1997) and Polit and Hungler (1995) share that methodological triangulation is also known as mixed-methods, multimethod or methods triangulation. Thurnmond further indicates that Lincoln and Guba (1985) have discussed methodological triangulation with reference to qualitative and quantitative methods indicating a paradigmatic connection, and also refered to qualitative and quantitative data collection methods, analysis and interpretational not a philosophical stance. This approach is divided into two types: within-method triangulation and between or cross-method triangulation. Within-method uses two data collection procedures from the same design approach, whereas in cross-method triangulation both qualitative and quantitative data collection methods can be used in the same research.

The triangulation types adopted for this research are data triangulation and methodological triangulation. To collect data for this research, in-depth interviews were conducted with different relevant stakeholders from the university for the purpose of evaluating the university's IT Governance. Different data collection methods such as interviews, questionnaires, observation, document analysis and briefing sessions were used. The feedback from different stakeholders gave a true reflection of IT Governance, and therefore reflects data triangulation. The methodological triangulation is also relevant for this research because it embraces multiple qualitative methods to research the programme. Rugg (2010) indicates that methodological triangulation is a variation on data triangulation with the emphasis on using data collected by different methods. Further, methodological triangulation is classified as both within-method and cross-method triangulation. The characteristics of the methodological triangulation supporting this research are defined in the data collection methods. The collected data using different methods leads and contributes to development of a framework, which in this research is the IT Governance Model for WSU which can be borrowed for any other new institution of higher learning that does not have an existing IT Governance in place. The proposed framework will be evaluated by experts in the field before it is confirmed as the final model. The section on expert evaluation is describe in section 4.6.

4.6   Expert Evaluation

Expert evaluation is an important component of the research output which influences the final model of the research. Expert evaluation, also known as heuristic evaluation, is a review of your product user interface by two or more usability specialists (Arbor, Alto, & Rochester, 2012).

Heuristic evaluation is further defined by Nielsen (2007) as a usability engineering method for finding the usability problems in a user interface design and rectified as part of an iterative design process, which is done by a small set of evaluators that examine the interface and judge its compliance with recognised usability principles (the 'heuristics'). Expert opinion can be used at any stage of a design, but in this research it was used after the first draft of an IT Governance model had been developed. Senior WSU ICT staff member and the acting ICT Director from the administrators team have given their expert input to the model. The expert input was sought from WSU for the purpose of testing if the model is valid for the WSU environment. In the case of this research, evaluation is also measured against the recommended experts' models as well as WSU documents addressing the challenges of the university IT systems. Sampling for this research is reported in section 4.7.

4.7   Sampling

According to Creswell (2009), the selection of a sample helps a researcher to understand the problem and research question. Eriksson and Kovalainen (2008) indicate that if the research is not primarily dependent on existing material, it definitely needs to identify a sample that will participate in the research. However, Creswell (2009) indicates that selecting a sample does not suggest the random sampling or selection of a large number of participants and sites as in quantitative research, but needs to consider the following four aspects:

- The setting – where the research will take place

- The actors – who will be osberved or interviewed

- The events – what the actors will be observed or interviewed doing, and

- The process – the evolving nature undertaken by the actors within the setting.

In this research study a purposive sampling technique was used to select the participants and was carried out into two phases. According to Harsh (2011), purposive sampling seeks to access key information in the field which can help in recognising relevant information to be studied. Barbie (2006) refers to purposive sampling as where the researcher selects units or elements which are most useful or representative to the research.

Phase one consisted of sampling universities internationally which are known for good IT Governance as well as national SA universities which adhere to the same criteria. Based on the lists of both national and international universities, one representing international and one representing national was purposively selected. WSU also had to be part of the research as a

case study as their current context and situation regarding IT Governance had to be scrutinised and compared to the two benchmarking universities (one national and one international).

The second phase of sampling involved the selection of participants. The participants were also purposively selected based on their roles in IT Governance structures.

The research sample for this research consists of different groups of participants, and these groups also vary from different cases under this research. The IT Governance setup for each of the three institutions studied was completely different. The participants were purposively selected according to their role in the institution's IT Governance. The participants included the Deans of faculties, Directors and Heads of administration, information and communication technology, facilities and library, different portfolios of IT Governance forum representatives, senior students and staff members from the ICT support desk. The participants were approached and agreed to participate in the research. The consent form was attached to the letter requesting access to the universities. For the two benchmarked universities, relevant participants were selected based on their roles in the IT Governance structure. An information leaflet and a consent form are reflected in Annexure A-5.

Table 4.4: Sample Group

Universities	Participants	Number
International University	Dean of Faculty	1
(University of Groninen)	Director – ICT Technical	1
	Director – ICT Academic	1
	Director – Administration	1
	Head of ICT Library	1
	Head of ICT Facilities	1
	ICT – Coordinator	1
	ICT Support Staff	1
	Demand Managers	2
	Software Advisory Board	2
	Member of ICTC	2
	Member IT Strategic Committee	2
National Benchmark	Director: Center for Teaching and Learning	1
(University of Stellenboch)	Senior Director – ICT	1
	Director – ICT Development	1
	Registrar	1
	Director Library	1
	Managers of Facilities	2
	Director ICT – Technical	1
	ICT Support Staff Managers	2
	IT Faculty Managers	2
Main Case	ICT Director	1
(Walter Sisulu University)	ICT – Administrator Representative	1
	ICT Acting Director and COO	1
	ICT Senior Staff	1
Total		30

The participants' portfolio name varied from one institution to the other, but all perform the same task. The differences are defined further in Chapter 5. The total number of participants for this research was 30, with 16 participants from the international benchmarking university, 12 from the national benchmarking university, two participants for the main case university (WSU) and the two experts from WSU to test the practicality and relevance of the proposed model to the WSU environment. The stakeholders' data analysis is described in section 4.8.

4.8   Data Analysis Techniques

Data collection is the systematic recording of information; data analysis involves working to uncover patterns and trends in data sets while data interpretation involves explaining those patterns and trends. Thus data has to be analysed to see how it supports (or not) our research questions with the goal of highlighting useful information, suggesting conclusions, and supporting decision-making. Data analysis has multiple facets and approaches, encompassing diverse techniques under a variety of names in different business, science, and social science domains (Walsham, 2006). Theory provides one of the ways in which data can be analysed which assists in understanding issues such as inscription, translation and other proccesses associated with the theory (Walsham, 2006; Seidel, 1998).

As part of the interpretative research family, hermeneutics focuses on the significance that an aspect of reality has for the people under research. Hermeneutics focuses on defining shared linguistic meaning for a representation or symbol (Klein & Meyers, 1999; Mayoux, 2005).

Due to its interpretive nature, hermeneutics cannot be approached using a pre-determined set of criteria applied in a mechanical fashion (Klein & Meyers, 1999). However, a meta-principle, known as the hermeneutic circle, guides the hermeneutic approach where the process of understanding moves from parts of a whole to a global understanding of the whole and back to individual parts in an iterative manner (Klein and Meyers, 1999). This meta-principle allows the development of a complex whole of shared meanings between subjects, or between researchers and their subjects (Klein and Myers, 1999). The hermeneutic circle ensures that meaning and biases are eliminated in data analysis. Hermenuetic theory supports this research because the aspect of reality of the phenomenon of IT Governance in WSU's multiple campuses and the two benchmarking universities will be investigated by collecting data from various sources including people under research. According to Gadamer (1976a) (as sited by Klein and Meyers 1999), a hermeneutic circle refers to the interaction between the understanding of the text as a whole and the interpretation of its parts in which descriptions are guided by the anticipated explanations. A hermeneutic circle allows a flow of time and a flux of meaning and is flexible enough to support a certain change since every understanding is finite and already on time (Dobrosavljev & Sad, 2002). The analysis of data from this research is supported by the hermeneutic circle because the benchmarking case studies and the main case research have been studied within their specific context to understand their respective IT Governance structures in each case. After the cases were studied in isolation within their respective contexts, they were thereafter studied jointly and compared to identify their

commonalities, strengths and weaknesses which were then used to assist in developing the proposed IT Governance model for WSU. Klein and Meyers (1999) have suggested seven principles to conduct and evaluate an interpretive case research based on the philosophical perspective of hermeneutics. The principles to conduct and evaluate interpretive research and their relevance to this research are defined in Table 4.5.

Table 4.5: Principles for conducting and evaluating interpretive research (Klein & Meyers, 1999)

The principles of conducting and evaluating interpretive research	Relevance of the principles on how and where they fit in this research
1. The Fundamental Principle of the Hermeneutic Circle This principle suggests that all human understanding is achieved by iterating between considering the interdependent meaning of parts and the whole that they form. This principle of human understanding is fundamental to all the other principles.	It has been used during the process of investigating each case IT Governance context and further applied when the comparison and analysis of different cases was done. Reference Chapter 5.
2. The Principle of Contextualisation Requires critical reflection of the social and historical background of the research setting, so that the intended audience can see how the current situation under investigation emerged.	The researcher's observation and experirnce of the IT Governance challenges within the main case research environment has led to the propostion of this research question. The critical reflection and background on how this research has emerged is further defined in Chapter 3 and Chapter 5 of the research.
3. The Principle of Interaction Between the Researcher and the Subject. Requires critical reflection on how the research material (or "data") were socially constructed through the interaction between the researcher and participants.	The researcher works for the main case; her experience and observation on the main case defines the critical reflection on how data was constructed from the main case. The researcher has also observed different IT infrastructures of the benchmarked cases.
4. The Principle of Abstraction and Generalisation Requires relating idiographic details revealed by the data interpretation through the application of principles one and two to theoretical, general concepts that describe the nature of human understanding and social action.	The concept of IT Governance in this research has been defined, interpreted and adopted through different maturity and best practices that informed the development of the proposed IT Governance for WSU. Chapter 2 and Chapter 6 demonstrate how this principle is applied in this research.

The principles of conducting and evaluating interpretive research	Relevance of the principles on how and where they fit in this research
5. The Principle of Dialogical Reasoning Requires sensitivity to possible contradictions between the theoretical preconceptions guiding the research design and actual findings ("the story which the data tell") with subsequent cycles of revision.	Literature in Chapters 2 and 3 has contributed to the intepretation of data in the process of concluding the findings of this research.
6. The Principle of Multiple Interpretations Requires sensitivity to possible differences in interpretations among the participants, typically expressed in multiple narratives or stories of the same sequence of events under research. Similar to multiple witness acounts tell it from a subjective viewpoint.	Experts were used to evaluate the proposed IT Governance for WSU to confirm its validity.
7. The Principle of Suspicion Requires sensitivity to possible "biases" and systematic "distortions" in the narratives collected from the participants.	The presentation of data from participants was done anonymously. Sensitive data describing different case environments were also labelled with letters.
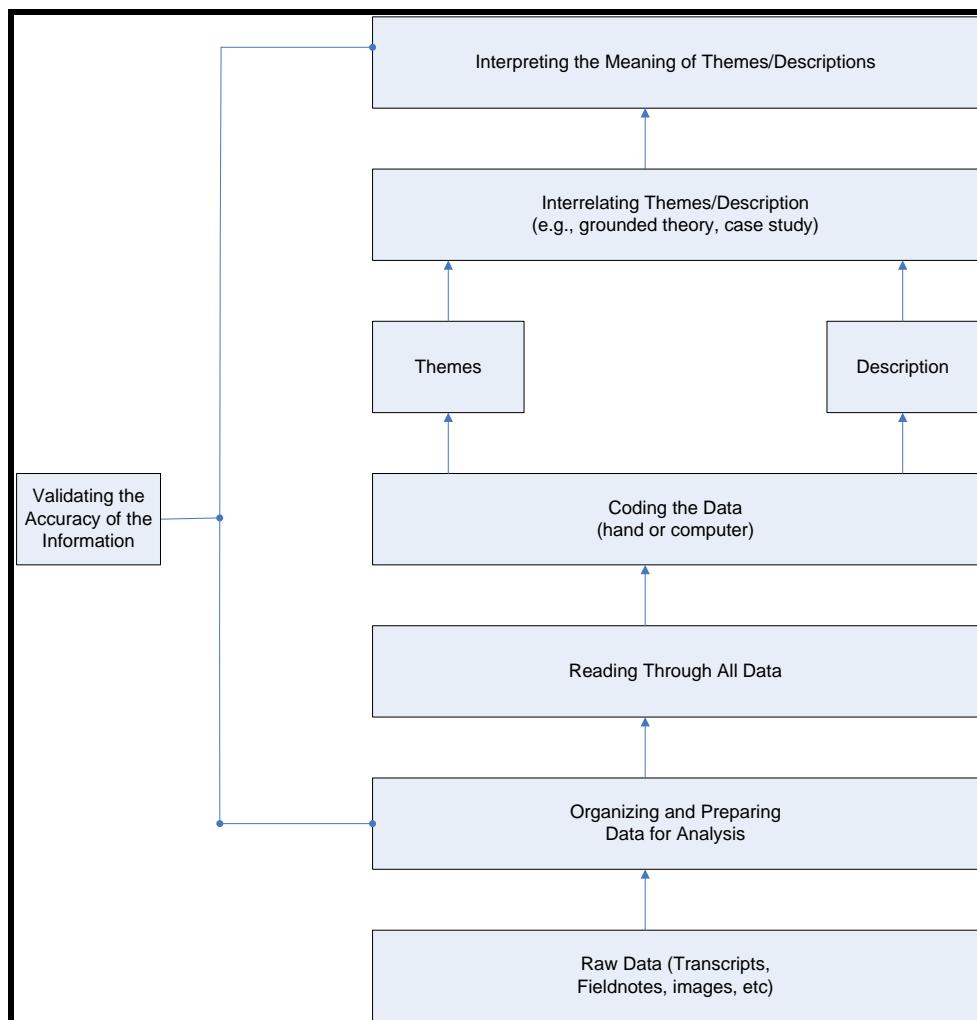
According to Onwuegbuzie and Leech (2007), most research questions in qualitative approach studies lead to different classes of data analysis namely within-cases, cross-cases and holistic-case analysis. This research employs these three methods of analysis because WSU, a formerly advantaged South African institution, and an international institution will be examined independently to identify their respective IT Governance strengths and gaps; various institutional data will also be analysed across institutions when comparison of the cases is complete. Thereafter it will be analysed jointly when suggesting and identifying relevent information that will contribute towards the development of the research model. In this research both within-case and cross-case analysis will be used in all three cases to analyse data. The researcher will use within-case analysis for the purpose of analysing the IT Governance themes for each case and thereafter a comparison of themes from three cases will be analysed to identify common themes across cases. Onwuegbuzie and Leech (2007) define these methods as follows:

- Within-case analysis involves analysing, interpreting and legitimising data that help to explain phenomenon in a bounded context and make up a single case, department, organisation or community (Creswell, 2007; Baxter and Jack, 2008). This type of analysis may apply to either single or multiple studies. In this research, each case was analysed to

identify themes of IT Governance for each case. The themes from within a case were compared across multiple cases in cross-case analysis.

- Cross-case analysis involves analysing data and represents a thematic analysis across cases. Themes relating to the IT Governance of three cases used in this research were examined to identify common themes to all cases.

- A holistic-case analysis examines the entire case and presents the description, themes and interpretation or assertion related to the whole case. A holistic-case study was used in this research in the comparative analysis of the three cases in order to present descriptions related to the whole case.

The researcher borrowed Creswell's (2009) data analysis process in qualitative research as illustrated in Figure 4.8.

Figure 4.8: Data Analysis in Qualitative Research (Creswell, 2009)

Creswell indicates that the data analysis process in qualitative research has blended general steps with specific research strategy steps. Figure 4.6 suggests the linear, hierarchical approach building from the bottom to top, but in practice it is more interactive. The levels of Figure 4.8 are emphasised in different steps as described in Table 4.6:

Table 4.6: Steps Describing the Levels of Data Analysis in Qualitative Research

Steps	Levels	Relevance to the Research
Step 1	Organise and prepare the data for analysis: Transcribing interviews, typing up field notes and sorting and arranging data.	The recorded interviews from paricipants were transcribed, and the notes from observations and visuals typed. The transcribed data notes were arranged and grouped into different types.
Step 2	Read through all the data: to obtain general sense of information.	The researcher read through the transcribed notes taken from the document analysis and observation to reflect on its overall meaning and also understanding its tone, relevance and credibility.
Step 3	Begin detailed analysis and coding process.	The researcher started sorting collected data and grouped them into related chunks and labelled them by attaching meaningful codes that readers would understand.
Step 4	Use the coding process to generate a description of the setting and themes for analysis.	Detailed information about main findings per case are described. The description involves people, places and events that made an effective contribution. The description is done for each case studied.
Step 5	Advance how the description and themes will be presented in the qualitative narratives.	The researcher discussed the list of events from different cases in detail considering their direct connection.
Step 6	Intepretation of data	The lessons learned from the research are captured through the comparison of data from the different cases studied.

Findings on data analysis are measured and confirmed by its trustworthiness. Measures of trustworthiness are described in section 4.9.

4.9 Measures to Ensure Trustworthiness

The accuracy of the findings in qualitative research is measured by its trustworthiness or the extent to which the findings are true to the research context. Babbie and Mouton (2001) indicate that the aim of scientific research is to generate truthful (valid and reliable) explanations, models and theories. Lincoln and Guba (1985) concur with the above authors and state that trustworthiness is a quality value if the final results and conclusions are reached in qualitative research. Creswell (2009) defines trustworthiness as the validation of findings to check the accuracy and credibility of the research through validity, reliability and a generalisability process. Lincoln and Guba (1985) confirm four criteria for measuring trustworthiness: credibility, transferability, conformability and dependability. The four criteria are defined below:

- Credibility

Credibility is more concerned with the validity of the research by checking if the researcher's approaches are consistent and reliable and further document the procedures of the case studies (Creswell, 2009). Credibility was ensured for this research because the researcher prepared the plan for collecting data. A briefing session with an IT Director regarding the different IT structures and IT Governance within the organisation was carried out. A report reflecting on the briefing sessions and document analysis was presented to the director for verification and confirmation before commencing with the interviews. Triangulation of data collection and data analysis used in the research have confirmed the trustworthiness (validity and reliability) of the research; see sections 4.6 and 4.7 for detailed information on triangulation and data analysis.

- Transferability

Transferability looks at the level of relevance of the research findings to other studies within the same environment and sharing the same phenomenon (Oates, 2006). The dense description of the background of information and findings in this research may be easily applied across other environments sharing the same phenomenon because the context of the academic institution of higher learning is common.

- Conformability

Conformability confirms the degree to which the participants' actions and perceptions are interpreted within a given context. Oates (2006) indicates that conformability describes the

procedure and process that the researcher uses to reach the findings of the research. The background Chapters and triangulation approach of data and to the methodology of the research capture the conformability of the results of this research.

- Dependability

Dependability shows how well the research has been recorded so that an audit trail can trace the steps taken to arrive at the presented results. Different cases were studied in this research and were all approached using the same research method. Expert literature in the same field of research has strengthened the researcher's ability to apply relevant methodologies for researching an environment. The research design applied has strengthened and guaranteed the trustworthiness of the research.

4.10 Ethical Consideration

Ethics permeate the way we live our lives in the community, work environment, business, research, etc. Ethics are considered as do's and don'ts in a normal business and community environment; however, ethics become more complex in social research (Eriksson & Kovalainen, 2008). Ethics in research consist of principles such as informed consent, the avoidance of deception, harm or risk, trust and respect for others (Creswell, 2009; Eriksson and Kovalainen, 2008; Henning, van Rensburg and Smith, 2004). The research ethics principles dictate the way the research is conducted and how research activities are governed. Cases studies deal with sensitive information such as policy documents, and direct interaction with candidates when conducting interviews which raises a number of ethical issues. Ethical consideration in this research involved protecting the rights of the participants and the institutions involved, and ensuring the scientific integrity of the research.

4.10.1 Protecting the Rights of the Participants

Participants who volunteered to take part in this research were informed about the purpose of the research and the role they would play before they accepted their participation. The rights of the participants were protected in this research by obtaining informed consent, demonstrating respect for confidentiality and anonymity, protecting the right to withdraw from the research, showing respect for human dignity, maintaining privacy and ensuring the principle of goodwill and justice.

- Informed consent

This research used the purposive sampling method to select participants; however, the participants gave their voluntary informed consent to participate in the research. After explaining the role of participants in this research, the researcher obtained the participants' informed consent reflected in Annexure A-5.

- Right to withdraw

Participants were informed that it was not compulsory for them to participate in the research and further informed them that they could withdraw at any time after signing the consent form or at any time during the research process without penalty.

- Anonymity and confidentiality

The participants' identities will be kept anonymously and data sources used in this research will be protected and will not be divulged to unauthorised people without the participants' knowledge. The audio tapes and transcripts and demographic forms will be stored in a safe place and will only be accessible to the researcher. It was also agreed that the audio tapes, field notes and interview scripts would be kept under lock and key for a period of three years after the report is released. The audio tapes and field notes were locked away to prevent any unauthorised person from accessing the data. This allows the researcher to publish at least three articles from the information contained on the audio tapes.

- Respect for human dignity

Questions to the participants were posed with respect and participants were allowed to express themselves fully without interruption unless where necessary. Difficult questions were rephrased and made simpler for the participants to respond without feeling humiliated. The researcher responded humanely towards their emotionality about the topic. No personal questions were asked.

4.10.2 Protecting the rights of the cases studied

The rights of the cases studied were protected by obtaining informed consent and permission from the relevant gatekeepers of the institutions studied, SU (see Annexure A-6), RUG (See Annexure a-7 and WSU (See Annexure A-8). An ethical clearance certificate was obtained from the ethics committee of the University of Fort Hare (refer to Annexure A-2).

4.10.3 Honesty and Trust

This research has adhered strictly to the ethical guidelines and standards of honesty and trustworthiness during data collection and data analysis. Plagiarism was avoided by

acknowledging all sources and references used in the research. The research findings and presentation was concluded without falsification and/or fabrication of information obtained from the participants. The thesis report is the original and independent work of the researcher and has not been presented anywhere else for whatever purpose. Those persons who contributed towards the successful completion of the research were duly acknowledged.
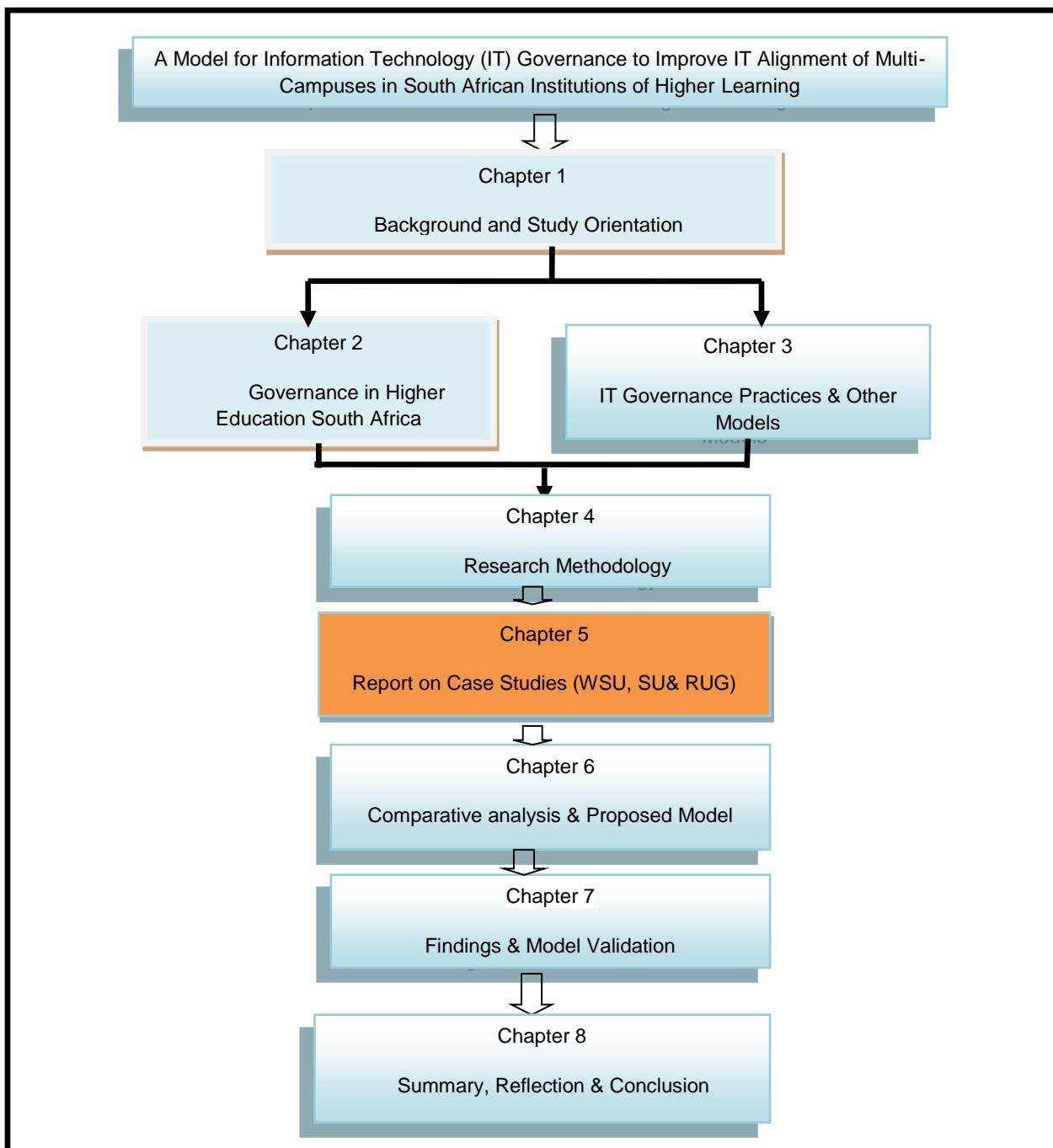
4.11 Conclusion

In this chapter the research processes were outlined along with the reasons for pursuing this research. The critical, positivism and interpretive philosophical assumptions were discussed. The interpretive philosophy was adopted for this research. This philosophy assisted the researcher to create a rich understanding of a possible IT Governance model which addresses the unique needs of Walter Sisulu University.

Qualitative research design has been chosen because it supports a case study research approach which was identified to achieve the required goal of this research. Methods of collecting data were defined: interviews, questionnaire, observation and document analysis. Data triangulation and methodological triangulation were adopted for this research, although other types of triangulation were also briefy described. The Chapter further highlighted different cases used for the research and indicates how the participants were purposively selected. The method of data analysis was explained and finally the measures for ensuring trustworthness of the research were also discussed.

The research methodologies explained in this chapter were critical to understanding the IT trends and structures that support IT Governance in different institutions. These methodologies were useful in building the IT Governance model for WSU. The next chapters describe how the methodologies were implemented for the success of the proposed model. The next chapter focuses on the cases studied and gives more details on each of the benchmarked universities.

CHAPTER 5: Diagram Overview

A Model for Information Technology (IT) Governance to Improve IT Alignment of Multi-Campuses in South African Institutions of Higher Learning

Chapter 1

Background and Study Orientation

Chapter 2

Governance in Higher Education South Africa

Chapter 3

IT Governance Practices & Other Models

Chapter 4

Research Methodology

Chapter 5

Report on Case Studies (WSU, SU& RUG)

Chapter 6

Comparative analysis & Proposed Model

Chapter 7

Findings & Model Validation

Chapter 8

Summary, Reflection & Conclusion

Chapter 5: Report on Cases Studied

5.1   Introduction

Chapter 3 of this research captured the internationally and nationally accepted literature on IT Governance standards and best practices used as a baseline in developing the IT Governance Model for WSU that addresses sub-question one of the research. Chapter 3 further provided a viewpoint of IT Governance as captured by different authors and its contribution to the proposed model; Chapter 3 is directly linked to the contribution made in Chapter 5. The findings in Chapter 5 came from first-hand practical information captured from the benchmarked cases for the purpose of learning about IT Governance in the environment of the institutions that serve the same mandate for research, teaching and learning as that of the main case studied.

The IT Governance structure of the cases is described in detail in this chapter and the findings contribute towards the development of an effective IT Governance Model specific to WSU. This chapter is designed to address sub-questions 2 and 3 of the research that seek to understand how IT Governance is currently structured and implemented at WSU and how it is structured and implemented in the benchmark academic institutions of higher learning in South Africa and iInternationally. Answers to these questions are addressed effectively by the interpretive research approach through the methodological principles for the interpretive process which has been found more relevant, as defined in Chapter 4 and further described in Table 4.1. Inductive logic of research in qualitative research is outlined in Figure 4.4, reflecting how the research process was established from the data collection phase, data analysis and the documentation of reliable and valid findings through comparative research defined in Chapter 6. The data collection methods are described at length in sections 4.5 and 4.6, which thereafter leads to the data analysis captured in section 4.9 and further defined in Figure 4.8 and Table 4.5. The following section explains the detailed description of the cases studied.

5.2   Case Research for Walter Sisulu University

Walter Sisulu University was purposively selected for the purpose of investigating the current state of its overall governance of IT systems. As highlighted above, it was trigered and initiated by the challenges the researcher experienced. WSU has multiple ampuses which are geographically dispersed in the deep rural areas of the Eastern Cape. Not long after its merger, it was put under administration after the independent assessor's report of recommendations (see Sections 2.4 and 2.5 of the research). IT systems and IT infrastructure inefficiencies were identified among other top governance challenges in the assessor's report further supporting the

researcher's interest in pursuing this research; IT has a significant impact on how a university effects its work, both academically and administratively. The findings at WSU were obtained through observation, document analysis and briefing sessions and interviews.

5.2.1   Observation

Since the researcher is working for WSU and her interest in pursuing this research was informed by personal experience, observation was used as the initial tool to identify different challenges regarding the university IT systems and infrastructure. Having identified IT-related challenges within the campus, further observation was extended to other campuses. Common challenges were identified in other campuses which confirmed that IT system challenges are prevalent aross all university campuses. The IT system referred to in the context of observation is at the operational level which captures the following:

- The computer software fulfilling the administration, research, teaching and learning mandate in computer labs and offices is outdated

- The computer hardware is very old and out of warranty and in the laboratories where there are new computers, they do not function due to a power problem and cannot connect to the server

- Some campus computer laboratories are not connected to the server and computers work as stand-alone computers

- Some administration and academic systems in different campuses operate on different legacy servers and systems are therefore not integrated

- Campuses have no effective physical computer and software security in their labs and offices and break-ins occur frequently

- ICT support services are still decentralised and operate according to the legacy universities

- The ICT services of the university are centralised according to the ICT policies of the legacy institutions.

The identified IT system operating challenges have delayed and affected the practical harmonisation of academic programmes as the core mandate of the university. After assessing the observation of IT systems in different campuses, the documents that address IT Governance related issues were analysed.

5.2.2   Document Analysis

Five documents were examined, two draft documents from central ICT, two Government Gazette documents by the DHET and one turnaround strategy by the Administrator technical team. These documents are defined in Table 5.1:

Table 5.1: Documents Viewed at WSU

Name of the document	Document Description
Department of ICT – Strategic Plan 2010–2015	This document is in draft format and was compiled in January 2010. It was developed to serve as a roadmap to the ICT strategic activities of the university.
ICT Governance Charter	This is a draft document compiled in June 2010 that describes the committee's proposal to oversee the management of ICT at the university.
Report of the Independent Assessor into the affairs of WSU: Gazette No. 34641	This document is a Government Gazette document which was released in September 2011 to report on the issues of WSU as recommended by the independent assessor appointed by the Minister of DHET. This document captures the findings and recommendations on the state of WSU as per the Minister's mandate.
Appointment of an Administrator for WSU: Gazette No. 34718	This document was published in the Government Gazette in October 2011 immediately after the publication of the assessor's report No 34641. Its purpose was to publicly announce the appointment of the administrator and further define the mandate and the responsibilities of the administrator at WSU.
Turnaround Framework Issues 1 – for WSU	This is a draft technical document compiled by the administrator and the administrator's technical expert that responds to the Minister's mandate of restoring WSU. This document outlines the entire university strategic plan for 2012–2014.

The two documents from ICT and the one from the administrator's technical team were all draft documents when this research was carried out; however, their contribution to the research was important. The documents show the current ICT plan for WSU this was critical to prepare for the proposed IT Governance model. The important points on the findings of the documents examined are captured in Table 5.2

Table 5.2: Summary of Documents Viewed at WSU

Name of the document	Challenges identified	Reference statement
Department of ICT Strategic Plan 2010–2015 (Document 1)	The ICT Strategy did not have enough input from the relevant university stakeholders.	*"The strategic plan is basically based on the outcomes of ICT retreat, Although several directors did not make it to the workshop".* See Document 1, section 1.1.
	The institution is still functioning in silos as legacy universities that affect the business processes and make them inappropriate and inadequate.	*"There is no question that WSU main problems have to do with inadequate and outdated processes which stem from the merging of three institutions".* See Document 1, section 1.1.
	Some ICT related functions overlap and are not clearly defined among the responsible departments, creating problems in service delivery. It also emphasises inadequacies and the problems of not having a proper IT guiding document in place.	*"The ICT challenge is facing is with the overlapping responsibilities mainly the security, bulk printing and lab maintenance"* see Section 1.2.2
	Security, including computer security, is a challenge in the university.	*'There is a strong feeling that data rooms where servers are not sufficiently secured"* `ee Section 1.2.2 and *"theft and vandalisation of computers is a menace at the university"* See Section 1.2.6
	Communication in ICT and other departments is a challenge in the university.	"*Across the campuses there is poor communication in ICT department that leads to a poor teamwork".* See Ssection 1.2.3
	There is a lack of qualified IT staff in the central ICT department.	*"It is generally accepted that ICT department lacks qualified staff "* See Section 1.2.3
ICT Governance Charter	The ICT Governance document did not cater for stakeholders at operational level.	*The identified committees are all at the high level of the university: see committee structure as outlined in the document.*

Name of the document	Challenges identified	Reference statement
	The central ICT department regards itself as a champion of ICT and other units responsible for ICT activities within their specific areas are independent of them.	"*The ICT Service department is not the only department responsible the deployment of ICT to users but as each department has unique objectives however it is totally independent to ICT Service Department".*
Report of the Independent Assessor into the affairs of WSU: Gazette No. 34641	The findings on the assessor's report are captured in section 2.4 of this research.	See point 9.5 of the report.
Appointment of an Administrator for WSU: Gazette No. 34718	The university systems, including IT systems, have collapsed.	*"Appoint a team of experts to assist the Administrator in critical areas given the all-encompassing collapse of systems, governance and financial management at WSU".*
Turnaround Framework Issues 1 - for WSU	The university does not have the capacity to develop an ICT Strategic Plan.	*"The university should outsource the task of developing an ICT Strategic Plan"* See project 5, item 5.1, 5.3 and 5.6

The main IT related challenges at WSU are captured in the draft ICT Strategic Plan 2010 – 2015, ICT Charter and the Assessor Report. The documents addressing the appointment of the Administrator and the Turnaround Framework Issues are more responsive to the challenges outlined from the other three documents and the researcher's observation. The three documents other than the draft ICT Strategic Plan and ICT Charter are generic to all challenges and strategies of the university and do not detail everything on IT related issues but capture information at a very high level. The findings on briefing sessions are described in section 5.2.3.

5.2.3   Briefing Sessions
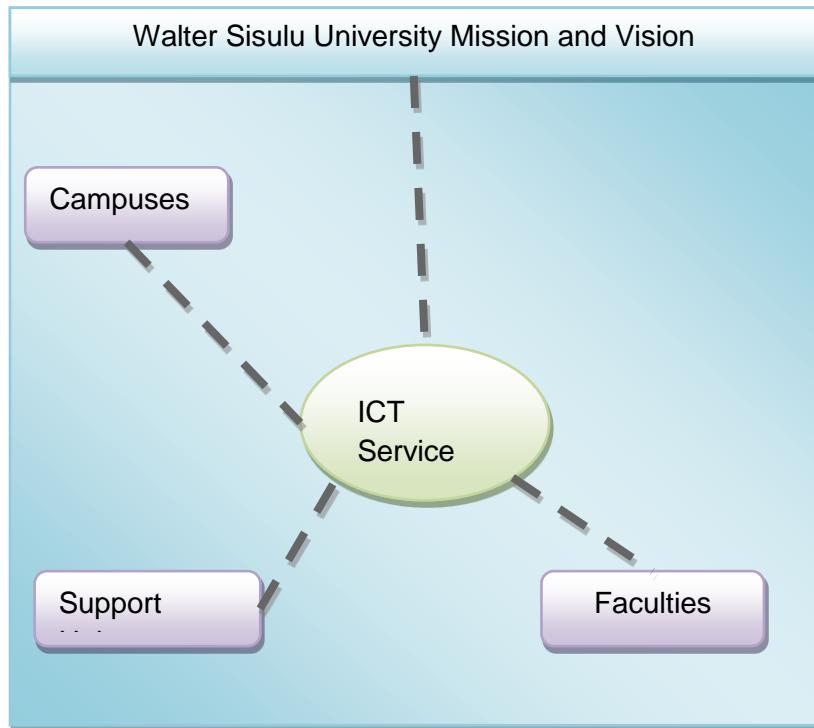
The briefing sessions with the IT Technical administrator expert and the Director of ICT Services were conducted at WSU and these sessions were scheduled differently. Their purpose was to elicit more information on IT related issues at WSU and assist in planning a schedule for follow up interviews for different stakeholders in the university. The Administrator Technical IT expert and the ICT Director agreed on many IT related issues during the briefing session despite the

fact that the sessions were scheduled separately. This shows the prvalence of some common IT challenges present at WSU. They agreed that:

i.   The university does not have an IT Governance structure although there is a draft IT Governance Charter that outlines the proposed committees to oversee and manage the IT Governance of the university, but this document has never been implemented since its inception.

ii. The draft IT Governance Charter has gaps in structuring IT Governance for a multi-campus university.

iii. The identified weaknesses confirm that the draft IT Governance charter cannot be considered as valid and effective for the university; hence the development of a new Strategic IT Governance document is required as indicated in the turnaround framework document.

iv. There are a number of gaps that have been identified in the draft ICT Strategic Plan 2010–2015 it is therefore considered invalid and will be replaced by a new IT Governance strategic plan as highlighted in the turnaround framework document.

The parties interviewed in a briefing session confirmed that the university at the present moment has no IT Governance structure; the ICT Director indicated that "our department is faced with challenges of a different kind such as scarcity of skilled IT personnel, gaps on formulated structures, lack of proper IT structures and communication problems between ICT staff from different campuses and other institutional departments at large". The Director's statement has been echoed by the Administrator IT expert by highlighting that "the University does not have IT structure that addresses the university objectives which could be caused by the lack of skills of the personnel in the ICT department, hence the IT Strategic Plan task will be outsourced to the external IT expert". Although these challenges were highlighted the ICT Director did mentioned their success stories such as integrating the networks of all campuses for the easy access of emails by the staff and students and the service desk system.

Due to the findings captured from the briefing sessions, follow-up interviews were not schedule because these interviews were applicable to universities with an existing and operational IT Governance structure. The findings on IT systems at WSU are summarised in Figure 5.1.

Figure 5.1: WSU Mission and Vision

The dotted lines in Figure 5.1 illustrate poor or no communication at all between the ICT department and other university stakeholders. The dotted lines between the ICT Department and the WSU mission and vision highlights that there is no direct link between ICT projects and the university mission and vision.

5.3   Case Research: University of Groningen (RUG)

The University of Groningen is one of the oldest universities in the Netherlands and is located in the city of Groningen; it was purposively selected as a benchmarking international university for this research. RUG was founded in 1614 and consists of nine (9) faculties and is recognised as a high level research university. The distance between campuses and faculties is within reasonable walking distance of 30 km apart with approximately 27,700 students enrolled. It is a member of the Excellent Group of the best universities in Europe and rated highly in the Global University ranking as published in the Shanghai Jiao Tong University annual publications. The university collaborates closely with local and international universities. RUG, in collaboration with the other universities, has championed a project called Wireless Groningen which is the first city-wide network in the world (Wallege, Poppema, Pijlman, & Bruggeman, 2009).

As indicated in Chapter 4, the findings for this case were carried out through questionnaires, briefing sessions, document analysis, interviews and observations and are further described in the following section.

5.3.1   Briefing Session at RUG

The briefing session was developed to capture some answers from questions on the generic IT systems and policy documents. During the briefing session, the researcher asked these questions in between the presentation of the IT Director who was giving a briefing session at RUG. The answers to the questions are summarised in Table 5.3

Table 5.3: Generic Questionnaire for IT in RUG

Indicate by putting "X" next to the correct answer regarding the following statements. Mark one answer for each statement such as Yes (Y) or No (N)	Y	N
1. There is unlimited access to the computer laboratories.	X	
2. Computer laboratories are connected to the network.	X	
3. Internet access is unlimited in the computer laboratories.	X	
4. There are computer laboratories dedicated tor practice, research, assignments and homework over a twenty four hour period.	X	
5. Computers in the laboratories and offices use current and updated application software and hardware.	X	
6. There is access to the printers in the computer laboratories.	X	
7. Printers are connected to the network and can be shared by students and staff in different venues.	X	
8. Real-learning application software such as wise-up, blackboard etc. are installed in the computer laboratories.	X	
9. IT systems enable students to use real-learning software effectively.	X	
10. Students and staff have e-mail and Internet accounts.	X	
11. Internet and e-mail is available and accessible in the students' residence.	X	
12. Computers in laboratories always work effectively.	X	
13. Students and staff can connect their personal equipment such as laptops, iPads etc. to the university network.		
14. During practical lessons, the ratio of computers and students in the computer laboratory is 1:1 (every student has his/her own computer).	X	

Indicate by putting "X" next to the correct answer regarding the following statements. Mark one answer for each statement such as Yes (Y) or No (N)	Y	N
15. The university has an IT Strategic Plan that addresses the needs of the university stakeholders.	X	
16. The university has a good IT Governance policy.		X
17. The university has IT Forums that address IT Governance related issues.	X	
18. There is a good partnership between the IT Department, industry and all other sections in the university.	X	
19. The IT Department schedules awareness programmes for all new developments such as changes in software, infrastructure and IT policies.		X
20. The university budgets for IT Projects in the central university budget plan.	X	
Comments: The university students and staff have access to the Internet on campus and when not on campus the university has access to the wireless network. Students who stay off campus have access to their private residential network that connects to the university server at a minimal fee. IT Governance is an institutional strategic topic which is supported by the executive management of the university. The awareness programmes are scheduled only when there are significant changes to the IT system, otherwise minor challenges are always communicated via university general communication tools, e-mail and electronic notice boards. IT is budget forms part of the overall university strategic plan as though IT is also budgeted within faculties, other university units and from third stream funds available. The IT Strategic Plan is a key document which serves as a policy document, otherwise the university does not have a specific document for IT Governance. However, there are IT policy documents for procurement of IT equipment, policy on acceptable use and access to university IT systems that however do not address high level IT Governance issues.		

The briefing session further captured and explained the way IT is structured in the university and defined different IT committees. At RUG Center for Information Technology (CIT) there is a central home for all IT support in the institution varying from education, innovation support and technical support; however, some IT components that are specific in supporting the daily functioning of other service departments are housed in various service departments. The other service departments that have IT components including CIT are Central Office, Library and Facilities. These units work together in improving and establishing good IT systems for the purpose of supporting research, teaching and learning within the institution. Key responsibilities of these units include but are not limited to the following:

a. Center for Information Technology (CIT)

The CIT is responsible for the institution's IT infrastructure ranging from networking, machines, software for achieving effective research, teaching and learning in the institution. The CIT consists of two units:

- Service, Processes and Projects

This unit is responsible for workstation and network services, service desk, network infrastructure, server infrastructure and project management.

- Education, Research and Development

This unit is responsible for application development, training and education and High Performance Computing and visualisation.

b. Library

The library is responsible for ensuring that all users are able to operate library information systems using computers, manage the library database and access of all their resource (articles, books, journals, etc.) through the online system.

c. Central Office

The Central office is responsible for managing institution data and information for easy access to all other departments that may use it for official use.

d. Facilities

Facilities is responsible for making sure that all the institution physical infrastructure such as buildings are well developed to support effective research, teaching and learning. It further manages all the physical and digital security control and access systems.

Since all the mentioned service departments are custodians of IT components specific to their departmental functions, special sub-committees were established to discuss any IT related developments and activities so as to avoid unnecessary overlaps of any kind and to produce a harmonised effective IT system. These sub-committees feature in different levels of the university organogram. Faculties are identified as an ICT client in the university which have its standing IT committees that oversee the IT needs of the faculties and communicate with the CIT. Table 5.4 describes the list of IT committees at RUG.

Table 5.4: IT Portfolios and Committees at RUG

Committee Name	Representatives	Level	Definition
Demand Managers	Demand managers from faculties.	Operational Level	Demand managers are the liaison representatives for all faculties and other service department IT requirements with the Central Information Technology. They also serve as the ICT-policy officers that advise the Faculty Board of their role and participate in preparing the budget for the faculty ICT projects. Some demand managers are appointed permanently. Demand managers meet once a month with the CIT Director.
Information and Communication Technology Committee (ICTC)	Consists of two members from CIT, one member each from library, central office and facilities. This committee meets twice a month.	Middle management level	Discuss important ICT issues including the needs of faculties presented by the demand managers to the CIT Director and the overall institutional IT projects. The deliberations taken from this committee are further presented in another high level committee called ICTO.
Information and Communication Technology Oversee (ICTO)	Consists of three members from the ICTC and one member from the Executive Board (CvB). ICTO meets after every six weeks.	Highest management level	Advises the university of IT projects that will be funded and the order of priorities of the projects to be funded. All university IT projects are screened and finalised by this committee.
Software Advisory Board	Committee of representatives of various units within the University.	High management level	It advises on software-related matters. Most importantly, it makes recommendations with regard to campus licences and the composition of the basic software package for the University Workstation (UWP). The board also advises on the standardisation of office applications and possible migration to new operating systems. It assesses the availability, costs and preconditions or licences and issues advice to the software fund manager and also

Committee Name	Representatives	Level	Definition
			regularly checks whether the current basic Software package or UWP applications are still up-to-date and how there are used.
Advisory Council of CIT – General Advisory Board	It consists of two members of CIT (CIT General Director and Deputy Director), five faculties and one student council representative. Meets three times a year.	Highest management level	The Advisory Council monitors the policies and the quality of the standard ICT services of the CIT. It also gives unsolicited advice to the Executive Board and CIT if requested about general policy, about the nature and quality of service and about associated budgets.
Scientific Advisory Council (ISAC) – Scientific Advisory Board for High Performance Computing and Visualisation (HPCV)	CIT General Director, Deputy Director and the head of HPCV, seven members from relevant faculties. The board meets at least twice a year.	High management level	ISAC advises generally on unsolicited policy towards High Performance Computing and visualisation (HPCV), and associated budgets.
ICT Strategy Commission BACK-BACK ICT Strategy Board	Consists of fifteen members from the faculties, service departments and students representatives. This board meets at least twice a year.	High management level	The Back ICT Strategy Commission is responsible for preparing the BACK ICT strategy plan for research, education, and organisation and ICT domains of the university. It also suggests a number of recommendations for the deployment of innovative ICT applications. The BACK ICT strategy plan is drawn up for a period of five years.

5.3.2 Document Analysis at RUG

Two main strategic university documents were analysed, namely the University of Groningen Strategic Plan 2010–2015 and the Multi-Annual Plan (Meerjareplan) ICT 2010–2014. The University Strategic Plan document highlights that IT is a strategic item in the University of Groningen, growing continually every time the university works its fundamental strategic issues. The university aligns and defines its IT strategy with research, teaching and learning and regular IT facilities goals that maintain and strengthen the excellent position of the institution nationally

and internationally. The university Strategic Plan 2010 stated that "In the coming years, the University of Groningen will invest in the next phase of its IT structure, both regarding the regular IT facilities and specific research tools (high performance computing).This is essential for the realisation of the University's quality aims". The university in its plan emphasises the importance of maintaining stable IT facilities as its demand grows in carrying out university activities, illustrating that RUG embraces IT and places it in its proper strategic place in the university plan. This is evident in the overall structure of the Multi-Annual Plan ICT 2010–2014.

The Multi-Annual Plan ICT has adopted the structure of 2005–2009 IT Strategy Plan based on the five domains in which IT is deployed. The domains are IT and Research, IT and Teaching, IT and Scientific Information Services, IT and Organisation, and IT and Infrastructure. Within these domains, IT has specific themes and developments that address the goals and objectives of the university as outlined in the university strategic plan. The Multi-Annual Plan ICT 2010–2014 defines different domain activities at length, however this research reports on how IT is viewed at RUG as a strategic topic in the strategy plan document. The findings on Multi-Annual Plan ICT 2010–2014 are summarised in Table 5.5.

Table 5.5: Findings on Multi-Annual Plan ICT 2010–2014 at RUG

Findings on IT views at RUG	**Supporting statement as per IT Strategic Plan document "The Multi-Annual Plan ICT 2010- 2014"**
1. IT is regarded as an investment at RUG and a tool that enables the university to reach and meet its competitive edge.	"...IT Strategy Committee proposes a number of dedicated investments in the coming planning period that will enable the University's researchers, lecturers and students to continue practising the academic disciplines at the highest level and remain visible in the global arena. In this respect it is very important to estimate as accurately as possible the scale of investment that the University needs to make in IT facilities in the named domains."
2. IT is an important strategic topic for the entire university's activities in reaching the university goal.	"The IT Strategy Committee will present a long-term IT plan to the institution. After the decision-making process relating to the plan, the IT Strategy committee is also responsible for its implementation. The plan will be evaluated halfway through the planning cycle and, partly on the basis of the results, a new plan will be formulated."

Findings on IT views at RUG	Supporting statement as per IT Strategic Plan document "The Multi-Annual Plan ICT 2010- 2014"
3. IT functions/activities in the university are goal driven and based on the main focus area the university wants to achieve at a particular in its time strategic plan.	"The Long-term IT Plan 2010–2014 is the third successive plan. Its motto is to: 'Build IT facilities and services for teaching and research that will help to maintain the international visibility of the University of Groningen'. The Long-term IT Plan 2010–2014 dovetails with the ambitions in the University's Strategic Plan for the period 2010–2015."
4. Overlapping responsibilities among the domains are addressed jointly and acknowledged before a final proposed budget for the IT Strategy is presented to the Executive Board of the university to avoid under budgeting.	"…The IT Strategy Committee therefore presents this plan expressly as a coherent whole, and all members of the committee have jointly discussed all the areas. The IT Strategy Committee therefore sees it as its task not only to identify the global and technological developments that the University needs to respond to in the coming planning period, but also and ,above all, to establish the scale on which this is necessary and how to do so as efficiently and effectively as possible."
5. All IT projects are budgeted for the current key projects and the future projects falling within the time frame of the strategic plan.	"The IT Strategy Committee proposes a total investment of K€ 18,645 for all these domains. The committee is aware that this is a considerable sum, even bearing in mind that it relates to investments over a period of five years. The committee is of the opinion that this proposal meets the requirements in terms of allocating an appropriate sum to provide the required facilities."
6. There are guidelines for the budget allocation of the proposals to be submitted to the Board of the University and all proposals should be developed accordingly to qualify for budget approval.	"When submitting the definitive proposals to the Board of the University, the IT Strategy Committee will pay attention to the following criteria: 1. The verifiable contribution of a proposal to one or more objectives of the University of Groningen Strategic Plan2010-2015 and/or other concrete objectives relating to teaching and research. 2. The level of possible internal or external co-financing. 3. The relationship of the proposal to other University policy, cooperation with other units within the University, or the acquisition of major projects."

5.3.3   Observation at RUG

Eriksson and Kovalainen (2008) and Voce 2005) indicate that there are different dimensions of observation, and are defined in Chapter 4; however, in this case physical settings and data through document analysis were observed. Observation on document analysis is captured in

section 5.3.2 whereas physical setting observation is captured in this section. Three main items that were observed are:

i.   Computer Laboratory setup and access

The computer laboratory setup in the library, classrooms and practising laboratory are examples of the excellence of the types of the computers that effectively support teaching and learning environment. Laboratories accommodate people with poor eyesight and for those students computer laboratories are easily accessible. Each block that the researcher visited had an open plan computer laboratory for easy access to staff and students. The main university library had computer laboratories for students and researchers to access catalogues, books, journals and different databases supporting research, teaching and learning components.

| Computer Suite accessible to staff and students in the university building | Special laboratory for people with poor eyesight accessible to staff and students |

Computer laboratory setup in the university main library accessible to all staff and students

ii.   Physical Access to Building and Reception

Physical infrastructure at the University of Groningen across all campuses visited by the researcher is first class, developed to provide a good environment for research, teaching and learning. The physical setup for reception and access to the building is secured and well designed. This supports the statement captured in the document analysis indicating that "facilities at RUG are developed to support administration, research and teaching and learning in the university which enables the university to maintain its standards as the world class international university." Reception in all support departments is physically welcoming which make the institution a first class university. The following are a few pictures captured during observation that illustrate the university face both internally and externally.
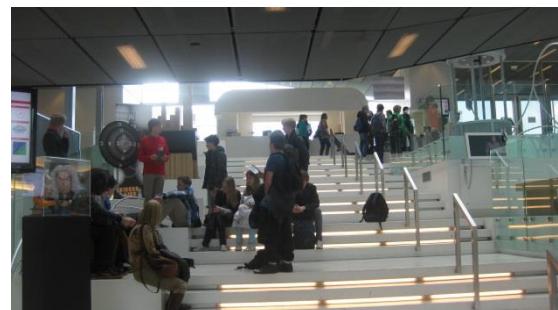
University block at Zernike Campus

CIT Service Desk for Students and

Student Support Centre in Zernike

Entrance Hall into the CIT Institute

The pictures illustrate the physical part of the infrastructure in RUG and confirm that University of Groningen's facilities are well vested in a planning and developing infrastructure that supports the university mandate.

iii.   Access to the network

Network connection at RUG and in Groningen is everywhere; this confirms that the University of Groningen, in collaboration with other partners, has enabled Groningen to be a wireless city.

The University is connected to the wireless network though it still uses a cable network in offices and laboratories. Accommodation sites used by the university have wireless access. The effective access to a network in the university indicates that the university has enough bandwidth that effectively connects all students and staff. On arrival at Groningen the researcher was assigned a login name and password for wireless connection to the university network and the Internet. Separate login details were also provided to use the wireless network in the residence to connect to the Internet.

5.3.4   Interviews at RUG

Interviews at RUG were designed based on the findings from the briefing session and document analysis to assist the researcher in collecting data from the relevant group of people. The purposive sample group of people interviewed is described in Chapter 4 section 4.7. The findings from the interviews are presented in themes captured from the different interviewees' responses. Table 5.6 outlines the themes, description of themes and their link to the COBIT 5 Principles.

Table 5.6: Research Themes Relevance to the COBIT 5 Principles

Themes	Description of the themes	Link to the International Standards: COBIT 5 Principles
1. ICT Strategies	The theme ICT strategies looks at different procedures in identifying the relevant ICT units that will be the core in the university for pursuing ICT activities that support the university mandate.	COBIT Principle 1: Integrator Framework that looks at providing a basis to integrate effectively with other standards.
2. ICT Strengths and challenges	Identify the benefits of using IT Governance in achieving the university objectives and further check how they contribute in meeting the university community/stakeholders' needs. This also looks at the challenges that affect/disturb the effectiveness of ICT functions in the university.	COBIT Principle 2: The Governance Objective: Stakeholder Value looks at creation which means realising benefits at an optimal resource cost while optimising risk.
3. Aligning IT goals to the university goals.	Viewing the ICT goals along with the overall university goals to establish the IT strategies that will directly address and meet the university activities and stakeholder needs. Constantly evaluating the effectiveness of the university IT strategies based on the rising needs of the university and industry.	COBIT Principle 3: Business and Context Focus: Looks at the enterprise goals and objectives by covering all the critical business elements. Work within the organisation context.

Themes	Description of the themes	Link to the International Standards: COBIT 5 Principles
4. ICT infrastructure and Personnel Resources	Identifies: • People who are involved in developing the university IT Governance model. • University infrastructure that supports all ICT driven activities. • University IT Governance practices, processes and procedures	COBIT Principle 4: Governance Approach - Enabler Based looks at the main elements of the governance approach such as governance enablers, scope and roles and relationships.
5. IT Governance	Identify the university forums that support and execute IT strategies within the university. These forums feature in the different levels of the university organisational structure.	COBIT Principle 5: Governance and Management Structured. Identifies a clear distinction between governance and management.

The following table further describes findings captured from the interviews.

Table 5.7: Summary of Findings from the Interviews

Themes	Presentation of Findings	Statements by Interviewee's
1. ICT Strategies	Regarding ICT strategy, the university has identified and established four units for the purpose of championing ICT related activities in achieving the university mandate. The identified units are described in section 5.3.1 and are: • Centre for Information Technology (CIT) • Library, • Central Office • Facilities	"*So in the past couple of years we tried to organise that in a better way and we recognised 4 departments who are active in ICT on the supply side of it, which is the CIT that focus on supporting the educational part.*"
2. ICT Strengths and Challenges	ICT Strengths • The strategic distribution of ICT activities among different units has been identified as the main value creation in the university because each unit focuses on and champions the key IT activities (functions) allocated to it. • The ICT distributed strategy enables the university to finish all its IT related projects within the agreed time frame. • IT related departmental proposals for funding clearly state the unit objectives and goals that are linked to the overall university objectives and goals which assist the university to budget and	"*But with decentralisation, it helps to equip the central system with what is happening with the faculties or departments. For me this strategy is quite a good one because all the faculties are presented in a central unit It is a two directional.*" "*….Firstly we try to come to alignment with the business needs. The business needs are supposed to be a result of the higher strategy of the university. So let's say that the university have say six strategic aims, we try to judge*

Themes	Presentation of Findings	Statements by Interviewee's
	allocate enough funds for IT projects. • Effective allocation of funds for IT projects enables the university to acquire first class IT resources and infrastructure that support the university in achieving its mandate. ICT Weaknesses • The university does not have standardised IT standards and guidelines which guide the university stakeholders regarding execution of all IT related activities.	*every investment that is in connection in supporting those strategic aims. One of the strategic goals is that, the quality and the number of actions that improve teaching and research need to be improved."* *"The positive side of decentralisation is that, there are more processes in the decentralisation for example the educational part is supported by CITEIS so there is a lot about the educational processes. So that's definitely a positive part of it."* *"We do not have manuals in our university a lot of things are arranged by practice and not by books"* *The negative part of decentralisation without proper guidelines in place is that, there is always some political struggle underneath because people discuss issues that do not need to be provided by them and It take time to coordinate things in a proper way.""We do not have guidelines but we have decided on some principles in the past for example a principle called buy before build. This is when somebody suggests a project to build something and it's possible to buy it official and this is preferred. The architecture board is actually working on a checklist with all these principles so that we change the attitude and say to project teachers, this is the checklist."*
3. Aligning IT goals to the university goals	IT goals are directly linked to the university goals because all IT projects that are developed in the units identified as the home of ICT are developed based on the university mission and vision. The special IT projects are only supported by the IT Strategic Committee if they have a	*"Firstly we try to come to alignment with the business needs. The business needs are supposed to be a result of the higher strategy of the university. So let's say that the university have say six strategic aims, we try to judge every*

Themes	Presentation of Findings	Statements by Interviewee's
	component that talks to the university objectives. IT projects proposed by different units are discussed and evaluated within the ICT Forums before they are implemented. The forums evaluate their relevance and contribution to the university goals.	*investment that is in connection in supporting those strategic aims. One of the strategic goals is that, the quality and the number of actions that improve teaching and research need to be improved. So we look at what business needs to be done to achieve those goals. So that makes a better line also vice versa business needs to understand why we do those things or why we do not do certain things."*
4. ICT Infrastructure and Personnel Resources	The university consists of the structured ICT forums on different levels of the organisational hierarchy that advise on IT activities and decide on IT infrastructure that helps to achieve the university mandate. The units responsible for handling IT activities of the university accounts for at least 70 – 85% of personnel at the university. The infrastructural resources are also adequately supported from the university overall budget and other forms of special funding.	"*University computers are replaced after every four years and the high end technology is budged for in the long term IT Strategic plan.*" "*CIT department consists of 258 staff members however they are not enough to support all the university community needs.*" "*Facilities department is responsible for all security infrastructures and systems in the university, there are technicians who are in charge of these systems during weekend and holidays the manager put a person on standby in the event of emergency.*"
5. IT Governance	The university has different IT forums that look at the different needs of the university IT structure. These forums as defined under the ICT infrastructure and Personnel Resources theme and do not confuse their management roles with the ICT governance roles. Each forum as defined above has a set of terms of reference that assist them in executing their mandate effectively.	The IT Governance forums are defined in section 5.3.1. IT Governance forum structure and its committees are represented in the different levels of the organisational structure. With regard to the role of ICTC the interviewer highlighted that "*The way it works is that, the board sends all the projects that are suggested to the ICTC to get advice on that and if the ICTC gives a negative advice then the board takes that advice.*" Regarding IT Strategic committee: " *the IT strategy unit is responsible for long term ICT plan which is*

Themes	Presentation of Findings	Statements by Interviewee's
		specially focused on innovations so for a time frame of 5years a number of subjects are decided on which get additional funding in the time frame of 5years to achieve them and part of it is research process and also for the organisational part and the educational part. So that is more a plan which has a direction with a number of innovations and a direction with a lot of money which is reserved for those innovations and which is controlling the programme and project portfolios and for shorter term." Regarding the university security *"The forum to discuss this strategy is the Security Council because in this council there are experts from different fields of the ICT. Each expert from his field identifies the risks and development and they discuss the measures to deal with this and then advise the board of CIT to implement more security measures."* *"As demand managers we meet every week. One week is for strategic discussion and the other week is a real meeting with an agenda and minutes. We always discuss the service level and what is needed and map out whats best for the university. On the other side we have a kind of a wish list of products we need for the university together. When we have individual submissions we contact the CIT and put questions there."*

The findings highlight that the RUG model is well structured and in practice works well for the university though it is not developed based on international IT best practices but has been developed from experience. This model has been rated 3 - acceptable (in the rating scale of 1 – ineffective, average – 2, acceptable – 3, effective - 4 and highly effective - 5) by 97% of the

participants and rated 4 – effective by 3% of the participants. One participant says "I think they are effective. On a scale from 1 to 5, I would give a rating of 3, because we are able to improve a number of IT than in the past. So this institute of IT grew in an organic way and in the past there was very little co-ordination some systems from the past are still in use and form more or less barrier to step to the modern applications."

It has been suggested that this model would work more effectively if the faculties appointed demand managers with an IT qualification, reduced resistance to change by some members of the university, increased the level of awareness and training programmes for the university community and also improved the level of communication within different units. Though RUG IT Governance has areas that need attention for improvement; the findings clearly indicate that it has started very well and can be used as a base for other universities that do not have IT Governance Structure at all. The Stellenbosch case is presented in the following section.

5.4 Case Research for Stellenbosch University (SU)

The University of Stellenbosch is a national (South African) case research which was purposively selected for benchmarking. It is situated in Stellenbosch, South Africa's oldest town after Cape Town and is located about 50 km from Cape Town. Teaching at Stellenbosch University is divided between the main campus in Stellenbosch, the Tygerberg campus (where the Faculty of Health Sciences is situated), the Bellville Park campus (where the University of Stellenbosch Business School (USB) is situated), and the Saldanha campus (housing the Faculty of Military Science at the Military Academy of the South African National Defence Force). The distance between these campuses is approximately 40 km apart. The SU was founded in 1866 and is one of the top African continent universities rated among the top international universities in the world. According to the HEQC Audit Report (2007), Stellenbosch University ICT was identified as having a strong ICT infrastructure, which further confirms that support services for teaching and learning in different campuses are the same and all major ICT expansion has been co-ordinated under the umbrella of the e-Campus Initiative. The SU news report of 2 December 2011 indicates that Stellenbosch University (SU) has for the first time been included in Leiden University's ranking of the top 500 research universities in the world. The Leiden Ranking further indicates that SU occupies the second position (397th position overall) among South African universities and "It is an objective indicator of excellence in scientific research. The fact that Stellenbosch made it onto the list, it means that it is one of the big international role players" said Prof Rob Tijssen at Leiden University.

The researcher used the same format of data collection at SU as the one used at RUG as defined in section 5.3.

5.4.1 Briefing at SU

IT Governance structure briefing sessions were carried out with one Director responsible for the IT Governance issues in the university as well as the IT Support manager. The responses captured in Table 5.3 of section 5.3.1 for the RUG case research are similar to the responses for SU with just a few variations in some questions and comments. Variations include the following:

i.   The sharing of printers by staff and students was not mentioned, but it has since been confirmed that students and staff and have access to high quality printing services.

ii.   The connection of personal computers, iPads, etc. equipment to the university network is arranged with the IT Support service; however when they have any kind of technical or hardware fault, they are not supported by the support service.

iii. There is no wireless network in the residence but all the rooms have cable network for students who connect to the university network and Internet.

iv.   IT projects are funded from the IT devision central fund and then further funds are sourced from the university strategic funds if funds from the IT devision are insuffient. Funds can also be sourced from external entities such as sponsors.

v.   The University IT Strategic document indicates that although university IT infrastructure is rated highly the university still has much work to do on IT Strategy.

vi.   Regarding IT Forums the university has introduced a new IT Governance structure which has not been part of the old IT Governance structure.

vii. Awareness programmes for new IT systems at SU are scheduled based on the degree of complexity of the new system introduced; otherwise if not complicated staff and students teach themselves the new system.

In the briefing session it was indicated that the university Central IT Department is structured into different operational units. The IT Senior Director manages the entire department and is also responsible for the effective employment of information technology and systems in support of teaching and learning, research, community outreach and management functions at the university. Each operational unit has a Director who reports to the IT Senior Director. The IT Senior Director and the operational units directors are refered to as IT Directorate. The units are catergorised as follows:

- IT Services and Operations

Responsible for supporting all users in the application and use of information technology, planning, implementing and operating institutional computer and network infrastructure, procuring and managing campus software licencing agreements and planning, implementing and operating various core systems such as institutional e-mail.

- IT Information Systems

Responsible for the operation and maintenance of central information systems and applications that support the university's core academic processes of teaching, learning and research, administration and management, and community interaction. The role also entails maintaining and nurturing relationships with the institutional process and system owners.

- IT Development

Responsible for the IT Division's portfolio of new projects, the analysis of information system needs, architecture, the design and development of solutions, project management, information security and the management of change as new solutions are implemented.

The briefing session also presented the university IT Governance structure, which was described as an evolving structure whose development was based on the King III Report. The structure is categorised into IT Strategy and Governance, Projects and Priorities, Information Governance, and Technology and Operations and consists of different committees. These committees are directlly linked to the different IT Directorate portfolios. The committees are presented in Table 5.8.

Table 5.8: IT Committees at SU

Committee Name	Representatives	Level	Responsibilities
IT Project Board	Consists of the IT Directorate and the IT Programme Manager	High Level	Decides on internal project priorities and allocates resources and ensures that the project portfolio is aligned with institutional strategy.
IT Programme Management Office (PMO)	Consists of the IT Directorate and the IT Programme Manager	High Level	Administers and co-ordinates IT's portfolio of projects and programmes, supports IT project managers, determines the IT project management methodologies and co-ordinates evaluation of project value after project

Committee Name	Representatives	Level	Responsibilities
			implementation.
IT Advisory Committee (ITAC)	Consists of IT Directorate, three members from rectorate, executive director finance and operations, 3 chief relevant directors, relevant Dean and one relevant manager every six weeks.	High Level	Guides IT strategy and IT investments and ensures that IT is aligned with institutional strategies, compliance with best standards, is integrated into institutional decision-making and resolves institutional IT investment and project priority impasses referred from the IT Directorate and the Advisory Forums
IT Funding and Investment Sub-Committee	Consists of IT Directorate, IT accountant, two members from finance	High Level	IT Advisory Committee on IT investments (renewals, infrastructure, growth), IT funding sources and model for projects and operations, communicates the value of IT investments, recommends actions around the continued financial sustainability of the IT Division and aggregate financial implications of projects.
IT-Research Advisory Forum	Consists of IT Directorate, IT Vice Rector Research, six other relevant directors, and faculty representatives. This forum meets at least once per semester.	Highest Level	Focuses on key research and postgraduate studies; stakeholders table IT needs, prioritise research and postgraduate studies related to IT projects, and ensure that IT's portfolio of services and investments are aligned with research and postgraduate studies requirements.
IT-Teaching & Learning Advisory Forum	Consists of IT Directorate, Vice Rector Teaching, eight other relevant directors including senior directors, academic representatives, facilities and lecture hall advisory group and student representative. Meets once per semester.	High Level	Focuses on key teaching and learning; stakeholders table IT and educational technology needs, prioritise e-learning-related IT projects, ensure that IT's portfolio of services and investments are aligned with teaching and learning requirements and co-ordinate as well as advise, consult with stakeholders.

Committee Name	Representatives	Level	Responsibilities
IT-Community Interaction Systems Work Group	Consists of Vice Rector (Community Interaction & Personnel), Senior Director: Community Interaction (CI), Management Information Officer, IT Directorate, and Manager: Research & Community Interaction Information Systems. Meets once per semester.	High Level	Focuses on key community interaction; stakeholders table IT system needs, prioritise community interaction-related IT projects, and ensure that IT's portfolio of services and investments are aligned with community interaction requirements.
IT-Support Services Advisory Forum	Consists of IT Directorate and other six relevant directors. The forum meets once a semester.	High Level	Focuses on key support services, alumni and community interaction; stakeholders table system needs, prioritise support service-related IT projects and ensure that IT's portfolio of services and investments are aligned with support services' requirements.
IT-Student Information System Work Group	Consists of the Registrar, five Deputy Registrars, IT Directorate, and Student Information System. The group meets twice in a semester.	High Level	Focuses on key student information; stakeholders table IT needs, prioritise student information related to IT projects and ensure that IT's portfolio of services and investments are aligned with student information requirements.
IT-Alumni and Development Systems Work Group	Consists of IT Directorate, four relevant directors, Student Information Systems, and two relevant managers. The forum meets twice in a semester.	High Level	Focuses on key development and alumni relations; stakeholders table IT system needs, prioritise development and alumni relations related IT projects and ensure that IT's portfolio of services and investments are aligned with development and alumni relations requirements.
IT- Financial Systems Work Group	Consists of IT Directorate, four relevant directors, relevant HODs and one Deputy registrar. Forum meets twice in a semester.	High Level	Focuses on key financial systems; stakeholders table IT system needs, prioritise financial systems related IT projects and ensure that IT's portfolio of services and investments are aligned with financial systems requirements.

Committee Name	Representatives	Level	Responsibilities
IT- HR System Work Group	Consists of IT Directorate, four relevant directors, relevant directors and managers. Forum meets twice in a semester.	High Level	Focuses on key HR systems; stakeholders table IT system needs, prioritise HR systems related IT projects and ensure that IT's portfolio of services and investments are aligned with HR systems requirements.
IT-Facilities Management System Work Group	Consists of IT Directorate, four relevant directors, relevant directors and Manager IT Business Systems. Group meets once in a semester.	High Level	Focuses on key facilities; management stakeholders table IT needs, prioritise facilities; management systems related IT projects and ensure that IT's portfolio of services and investments are aligned with facilities management requirements.
Information Security Management Committee	Consists of IT Directorate, five relevant directors, relevant directors, forums/groups representatives and Manager IT Business Systems. Group meets once in a semester.	High Level	Focuses on reviewing and approving the Information Security Regulations, subsidiary policies and regulations developed in terms of the Information Security Regulations, and annual Information Security Plan, define Information Security responsibilities and appoint responsible persons in Information Security roles across the institution, reviewing and monitoring major security incidents, monitoring significant changes in the exposure of IT assets to major threats, initiating and reviewing regular risk assessments, reporting to the Risk Management Committee on Information Security issues and advising Executive Management on Information Security issues.
Information Curators Forum (ICF)	Consists of six relevant directors, one rector, two deans, and Information Managers Workgroup. Forum meets one in a semester.	High Level	Focuses on advising university management on information strategy, on information policy, standards and practices, establishes information ownership, curatorship and accountability, determines information management priorities, approves

Committee Name	Representatives	Level	Responsibilities
			information management standards, co-ordinates cross-institutional projects related to information management and determines information management needs.
Information Managers Workgroup	Consists of seven relevant directors, managers, officers and forums. Forum meets monthly and as needs arises.	High Level	Focuses on ensuring data quality between and within information systems, determines and controls procedures and standards related to data quality, flows, maintenance and definitions and co-ordinates cross-institutional problem-solving around data quality issues.
ICF Secretariat	Consists of IT Directorate, four other relevant directors, and Management Information Systems. Forum meets monthly and as needs arise.	High Level	Determines ICF agenda and co-ordinates implementation of actions, laises between IT and IRP regarding the management of the provision of institutional information, including research into new technologies and prioritisation of projects related to the provision of institutional information.
Campus IT Governance Committee	Consists of seven relevant directors, managers and SRC technology representatives. Meets once per quarter.	High Level	Focuses on governing and co-ordinating the coherent provision of ICT services campus-wide and aligns ICT projects, investments and budgets in areas outside the direct control of the IT Division, with those of the IT Division.
Web Committee	Consists of relevant directors, managers and student Media House. Meets once a month.	High Level	Focuses on governing and developing institutional strategies for all web and mobile portals, intranet and public-facing websites, co-ordinates integrated development and support of services for the above, ensures sustainability and relevance of these technologies for the institution over time and advises university management on web, mobile and portal strategies.

Committee Name	Representatives	Level	Responsibilities
Internet Forum	Consists of Director (Services and Operations), relevant managers, deans, and research, faculty and student representatives. Forum meets once in a semester.	High Level	Focuses on identifying Internet needs, ensuring that the Internet meets academic requirements, discusses and determines Internet service levels, explores alternative Internet funding models and assesses risks and opportunities relating to Internet availability.

5.4.2 Document Analysis at SU

Document analysis at SU was handled differently from other cases because part of it was analysed during the briefing session. In the briefing session the SU Draft IT Governance Framework document was presented and used as a base in carrying out the briefing session. The findings on the SU Draft IT Governance Framework which presents the university IT Governance structure, are captured in section 5.4.1 of the briefing session. The other three documents sourced from the university website were analysed. Two documents are reports (for 2008 and 2012) by the Executive Director of operations and finance reports and the other document is a background summary of the e-campus project. The Executive Director 2008 report defines university IT as follows: "The University's information technology systems and infrastructure are an essential and integral part of the University's teaching, research, community interaction and administrative activities. To ensure that the powerful infrastructure and systems are used optimally, critical investigations and analyses are undertaken continuously to make provision for proactive adjustments and extension." Whereas the 2012 report defines it as follows:
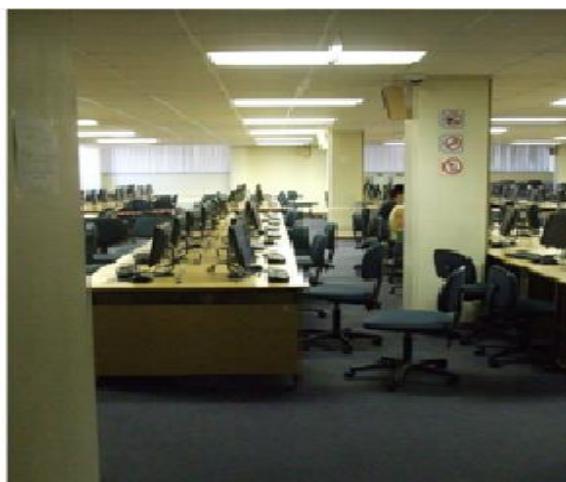
"Information and communication technology (ICT) is indispensible, not only to support the University's administrative processes effectively and sustainably and to allow them to function accordingly, but also to extend the expertise base for research, learning and teaching and community interaction in a sustainable manner."

Both definitions by the Executive Director clearly describe the level at which IT is embraced in the university and further indicates that IT is developed based on all three important mission and vision aspects of the university such as students (main university client), support (all the support units that make the university client happy such as admissions, facilities, etc.) and core components (research, teaching and learning). The IT Strategies used in achieving the university mandate are captured in detail in the reports. See Exeutive Dirctor Operations report
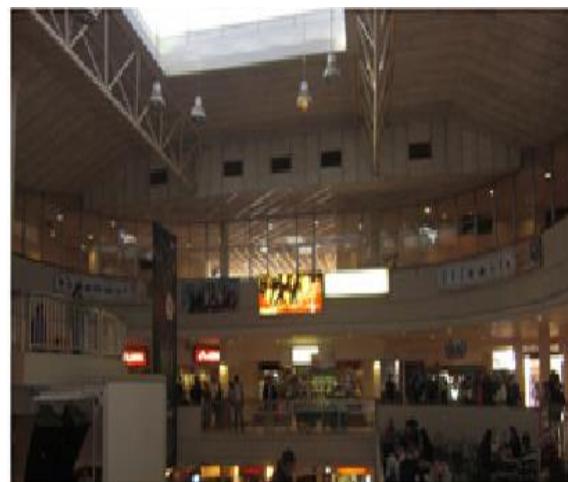
at www.sun.ac.za for detailed information. This report further highlights that the increase in the use of first class technology throughout the university has also increased the electrical consumption. However, the challenge is strategically handled by exploring other possible ways of reducing the electricity consumption. The e-Campus report indicated that the e-Campus Initiative was launched at the University of Stellenbosch in 1999 after the university realised the importance of adopting an integrated and well-coordinated approach to ensure that IT contributes in improving the quality of service delivery of the university. It has also been highlighted that ICT is one of the university's most valuable assets and is a university strategic investment.

5.4.3 Observation at SU

The observation at SU was carried out in different formats. During the briefing and document analysis section it was observed that the university had an existing IT Governance Framework which guided the processes of executing IT activities and articulated the roles and responsibilities of different university stakeholders in achieving the university mandate. Details of the findings from the briefing session and document analysis are presented in sections 5.4.1 and 5.4.2. The physical observation of the university infrastucture was observed and pictures of the sample units are captured below.

Computer Laboratory at Business

Students Mall – Restaurants' View

Magda Block on the Stellenbosch main Campus

Library Study and Research View

The pictures illustrate that the university infrastructure is developed to create a conducive environment for teaching and learning and further highlights that computer hardware and the computer laboratory setup are in good shape to create and support research and teaching and a learning environment.

5.4.4   Interviews at SU

The interviews at SU followed the same format as in RUG see section 5.3.4. The findings from the interviews at SU are presented in Table 5.9.

Table 5.9: Summary of the Interview findings at SU

Themes	Presentation of Findings	Statements by Interviewees
1. ICT Strategies	Regarding ICT Strategies at SU, ICT is partly centralised to the ICT Department and partly decentralised to the different departments with IT activities that support specific departmental needs. The decentralised IT activities are located in the library, faculties, admissions and facilities.	*" My role as a Faculty ICT Manager is to look at the student's facilities and the student's academic environment and provide them with IT infrastructure to support their needs i.e. computers and labs."* *"Admissions have a person who is in-charge of the whole IT systems as far as academic administration is concerned. He is involved with developing new programmes to do support our administration activities and also hands on in the day to day functioning of the whole academic computer system."* *"Facilities and IT sit next to each other in the organisational structure and most IT strategic decisions regarding IT and security*

Themes	Presentation of Findings	Statements by Interviewees
		in the university they take it together, but regarding IT related activities facilities is responsible for all security, access and network cabling activities in the university."
2. ICT Strengths and Challenges	ICT Strengths • The strategic distribution of ICT activities among different units has been identified as the main value creation in the university because each unit focuses on and champions the key IT activities (functions) allocated to it. • Allocation of funding for ICT projects within the units enables the different units to gain a fair share of funds. • Departmental IT strategies are simplified and address the needs of the units in achieving the university objectives. • Strategic involvement of the Rectorate in the IT Governance structure contributes to the constant support of the executive management of the university	*"Yes, off course the IT infrastructure that is central and the decentralised have most to do with our own system and also the support that we provide .It works for us, off course there are challenges such as not having sufficient staff when we take new IT projects which the university has not embarked on that is library specific we need to prioritise. We have had discussions on some of the things like software and hardware support that could be provided by central ICT so that we can concentrate on the specialised specific areas that we have."* *"It's not only specialised computer equipment; we have our own budget for our equipment and the policy says that every 5 years we have to replace the equipment. We have our own budget we get based on our inventory about what we need getting prices and we use the vendors list."* *"Yes. The major benefit of brining that role into a faculty is that, services needs between faculties differ. You can now target the specific group and service them to specification and make sure that they get what is needed in that faculty. In the end there are big benefits in cost reductions. You will get the correct specific volumes needed for softwares."* *"Firstly each of the second level in the organisation, the vice rectorate each one of them has his forum relating to IT and each of the vice rectors are represented on an advisory committee to IT. The outcome of that is feed into the board that needs to report on the progress of implementation of good business practices. I had to report to the board about the extent we use internationally accepted good governance principles."*

Themes	Presentation of Findings	Statements by Interviewees
	ICT Weaknesses • The university does not adhere to IT standards and guidelines regarding the execution of all IT related activities. • Communication is also a challenge in the organisation.	*"At this university we do not have uniform management structure and uniform that works between the different management environments i.e. my faculty of economics and management sciences, uses a management for faculties with representatives from each department that defines the academic needs and they specify the technology to be available for next year, however other faculties in our environment do have other forums and other management boards."* "Communication *is one of the major problems we have in the academic environment. The biggest problem is if you try to drive technology through setting your scope of responsibilities on demand and try to generate the input from the users, you will never get the response."* *"People do not understand the IT language, we do communicate with them but they pretend as if they saw nothing or read nothing with regard to our message. We send messages from the web, newsletter but some people just choose to ignore.*
3. Aligning IT goals to the university goals	IT goals are directly linked to the university goals because all IT projects that are developed are based on the university mission and vision. The special IT projects are only supported by the IT Strategic committee if they have a component that talks to the university objectives. IT projects proposed by different units are discussed, evaluated within the ICT Forums before they are implemented. The forums evaluate their relevance and contribution to the university goals.	*"We have been developing policies based on good governance or what the internal and external auditor require us to develop in terms of good business practices. These policies we develop, we put them on the web, and we also have regular newsletters that go out to the user community to inform them of the current state of IT. Our websites communicates frequently asked questions."* Further emphasis on linking IT strategies in the institutional strategies is highlighted as an example. *" let me give you an example; the university is looking at how ICT can be used to change the shape and size of the university. To debate whether we should use technology for distant education or whether we should use technology to enrich teaching and learning process. We have a committee at the moment that is chaired by*

Themes	Presentation of Findings	Statements by Interviewees
		the vice rector for teaching and learning as a task team. The task team will develop a charter within the next 2 weeks which will guide the executives. The executives will approve it and then it will be debated into one of the forums again. The high strategic initiative can be developed outside the forum and it can be special task team to address the visions and missions and package this as a project. Once this has been accepted as a strategy to the university by the executive it is then send back to one of forums to debate it and optimise the strategy."
4. ICT Infrastructure and Personnel Resources	The university consists of the structured ICT forums on different levels of the organisational hierarchy that advise on IT activities and decide on IT infrastructure in achieving the university mandate. The units responsible for handling the IT activities of the university account for at least 70–85% of personnel in the university. IT Strategy in the university is financially supported by the university's overall funding and other means of funding; infrastructural resources are in good shape.	"*University computers are replaced after every four and half years.*" "*The funding of IT projects are based on internal funding from the IT division and if there are not adequate funds they are earmarked funding that comes from a strategic project or it can be funded from external division.*" "*The forums that are linking the faculties are specific ones. The academics are represented on some of the forums and not all the forums.*"
5. IT Governance	The university has different IT Forums that look at the different needs of the university IT structure. These forums as defined under ICT infrastructure and Personnel Resources theme do not confuse their management roles with the ICT governance roles. Each forum as defined above has a set of terms of reference that assist them to execute their mandate effectively.	The IT Governance forums are defined in section 5.4.1. The IT Governance forum structure and its committees are represented in the different levels of the organisational structure.

The IT Governance Framework at SU is rated between 3 and 4 by 100% of the participants in the rating of scale of 1 – ineffective, average – 2, acceptable – 3, effective – 4 and highly

effective – 5. The Dean says "I wish I could tell you 5, I am a conservative and my personal rating would be 3. We doing well but there is still more work to be done especially in formalising structures and aligning them with all university activities. We are really getting there so I will give it a 3."

The IT Governance Framework at SU is confirmed to be effective though it has been recently reviewed is new to the university community. The forums and structures that have conceptualised the framework have started very well. Since the framework is defined as new, findings indicate that it has not yet been effectively communicated to the whole university community; some of the forums have failed to convene and some need attention because there are large and cannot function effectively. Despite the limitation of the framework, the interviewed candidates recognised it as good to start and that good IT Governance practices in the university had been established.
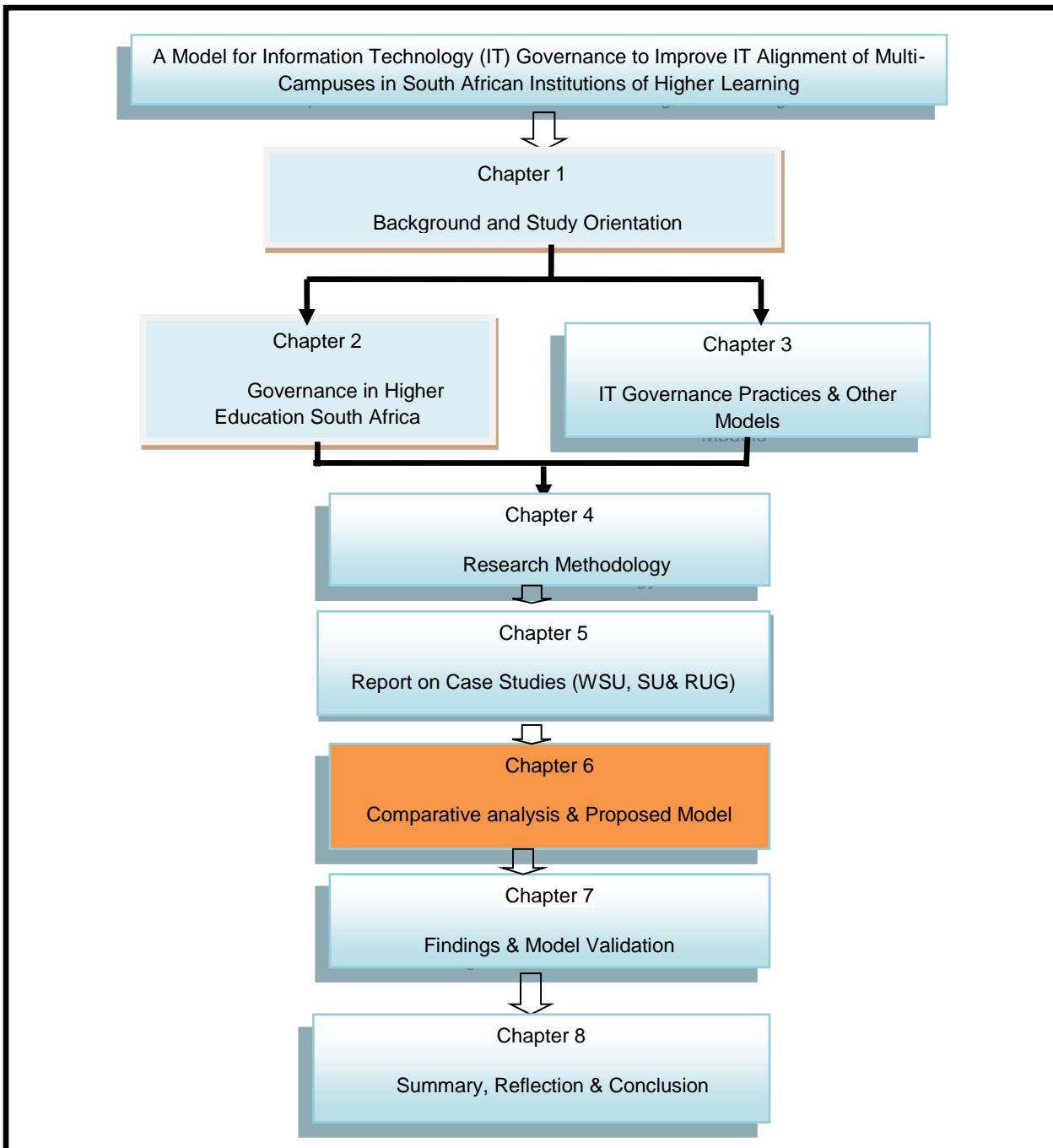
The findings captured the three case study reports on the current state of their IT Governance model. For benchmarking purposes the current state of the cases is compared to highlight their strengths and weaknesses. The comparative analysis summary of the cases studied and the proposed IT Governance Model are presented in the following chapter.

5.5   Conclusion

The findings in this chapter explained the current state of the IT Governance in the cases studied. The strengths and weaknesses of the cases were identified for the purpose of informing the proposed IT Governance Model for WSU. The findings on the benchmarked cases present many similarities in their IT structural arrangement such as an IT department organogram, IT committees and commitment of the university stakeholders from various levels. The findings explained in this chapter were important for the development of the proposed IT Governance Model for WSU. Several ideas and IT benefits that were noted at the two benchmarked universities were used to develop the WSU proposed IT Governance model as explained in the next chapter.

Chapter 6: Diagram Overview

Chapter 6: Comparative Analysis and Proposed IT Governance Model for WSU

6.1 Introduction

This chapter reports on the summary of the comparative analysis of the cases studied and further presents the proposed IT Governance Model for WSU. The chapter responds to the research sub-question 4 which sought to identify the components necessary to develop an IT Governance model specific to WSU. Based on the comparative analysis of the cases studied an augmented theory was built, informing the development of the proposed IT Governance Model focusing on strategic alignment of IT strategies with the university for the purpose of using IT as tool to improve services and achieve the university mission and vision.

The findings explained in Chapter 5 and the summary of the IT Governance in Table 6.1 (below) were used to develop the model. However, before the actual model development a few steps were followed. These steps were based on the analysis of the findings and the current state of the IT structure in the cases studied. The steps led to the research process that was vital for the model development.

6.2 Summary of Comparative Analysis

Detailed findings on cases studies are reported in Chapter 5; this section summarises and compares key components of IT Governance areas of interest identified in the cases studied. This comparative analysis also forms part of the within- and cross-case analysis as explained in Chapter 4. This allowed for triangulation of findings as well as the application of the hermeneutic circle. These components are captured in Table 6.1.
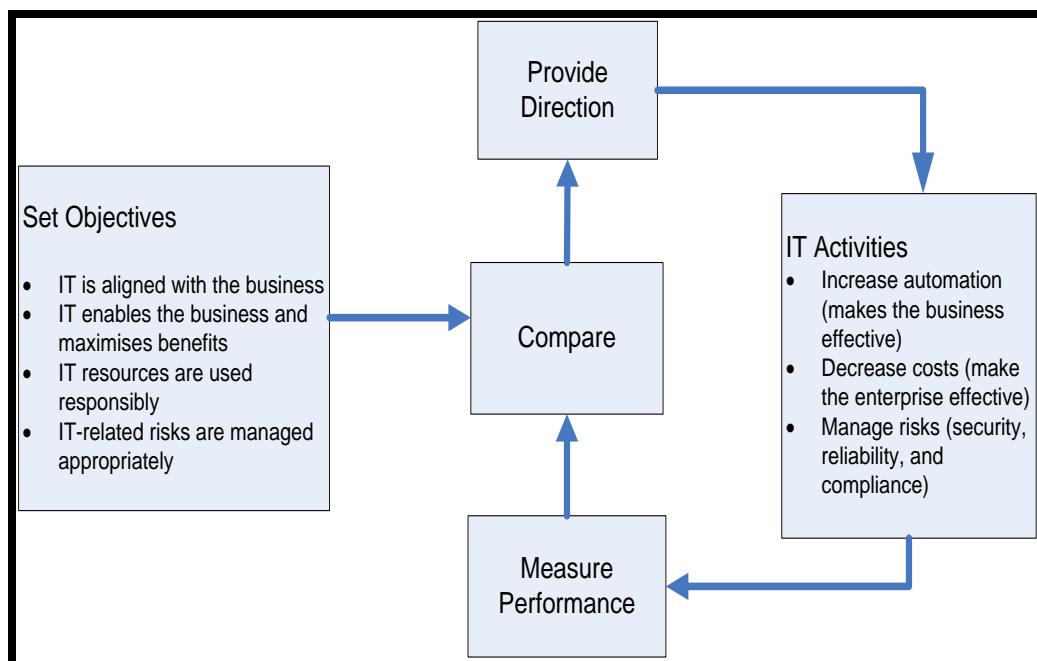
Table 6.1: Findings summary of the key components compared

IT Governance Components	SU	RUG	WSU
IT Governance Structure	Yes	Yes	N/A
Alignment of IT and University	Yes	Yes	Partial
IT Strategic Plan	Yes	Yes	Yes
IT Infrastructure	Yes	Yes	Partial
IT Forums	Yes	Yes	N/A
Effective communication	Partial	Partial	N/A
Senior Management Participation	Yes	Yes	N/A
IT Projects Funding Formula	Yes	Yes	N/A

IT Governance Components	SU	RUG	WSU
Skilled IT Personnel	Yes	Partial	N/A
Partnership of IT Department with other other departments	Partial	Partial	N/A
IT Awareness Programme	Partial	Partial	N/A

Table 6.1 shows the main IT Governance goals that were useful in developing the proposed IT Governance model. Each of the goals was checked for availability and usability at each of the case universities used. The terms Yes, Partial and N/A were chosen to explain each of the IT Governance goals. For, example at WSU the alignment of the IT and university strategic plan was referred to as partial, indicating that there was minimal IT alignment to the university strategic plan. The term partial for effective communication for SU and RUG means that the two universities still see some room for improvement in communication.

The research process is as follows:

Figure 6.1: ITG Process: (National Computer Centre, 2005)

The IT Governance Process used in this research is similar to the COBIT Framework as indicated by Fernandez and Thomas (2008). The same IT Governance process was borrowed in this research as indicated in Figure 6.2. The first step of the process is set the ICT objectives. These ICT objectives have to be aligned to the institutional goals and specify how the ICT resources are used responsibly. The second step of the process compares the existing IT

Governance standards to give direction to the identification of IT activities in the institution. For this research the IT Governance model of the benchmarked institutions and other IT Governance best practices were compared to identify ICT activities relevant to WSU IT Governance. These ICT activities enabled the establishment of a proper ICT direction that could be followed in order to generate a useful IT Governance model. The IT Governance process also includes a major process to measure the performance of the IT Governance to the institution. The IT Governance process helped to develop the proposed model. For the purpose of this research, this process was followed and allowed for key ICT aspects to be used to design the model. The IT Governance process in Figure 6.2 enabled the generation of important steps which were necessary to formulate the IT Governance model for WSU.

6.3   WSU IT Governance Model procedure

Before explaining the model development procedure, there are various components which the researcher considered before developing a functional IT Governance model for WSU. These components are listed in point form as follows:

- Define the meaning of IT Governance within WSU and where IT Governance fits
- Identify any institutional/environmental/cultural constraints and enablers
- Identify all stakeholders and have a broad understanding of IT Governance issues and benefits across all stakeholders
- Agree on, publish and gain acceptance of an initial IT Governance framework, tools and processes
- Complete an initial gap analysis against best practice to demonstrate where IT Governance is already in place and to highlight areas of focus for the roadmap
- Create a Project Plan with definition and prioritisation of the initial IT Governance project deliverables
- Identify and commit to the resources required to deliver this initial project
- Align the IT Governance Initiative with the WSU objectives
- Identify skill sets and capabilities needed from people involved
- Select various IT Governance committees responsible for the management and monitoring of all the ICT planned strategies
- Draw up an effective communication plan – who, what, when, etc. to overcome any barriers and to motivate change
- Explore opportunities to adopt industry best practice model, or standards framework and utilise external influences

- Create a measurement approach for an area or activity to expose actual evidence of problems

- Develop the proposed IT Governance model.

Understanding of the listed procedural steps helps in constructing the actual ICT plan. The ICT plan process focuses on the ICT areas which have to be considered. These steps only target ICT areas and as such should be clearly stated to ensure a clear ICT understanding within the institution.

6.4   ICT Planning process

The ICT process which was followed before the development of the IT Governance model for WSU includes the following steps. These steps are listed in point form.

- Define a Strategic Information Technology Plan

- Define the Information Architecture

- Determine the Technology Direction

- Define the ICT Organisation and Relationships

- Manage the Investment in Information Technology

- Communicate ICT Management Aims and Direction

- Assess ICT Risks

- Identify ICT Solutions, Acquire and Maintain Technology Architecture

- Develop and Maintain Information Technology Procedures

- Manage ICT Performance and Capacity Ensuring Continuous Service

- Ensure Systems Security

- Educate and Train Users on ICT systems

- Assist and Advise Information Technology Customers

- Monitor the Process

- Develop ICT Governing Steps.
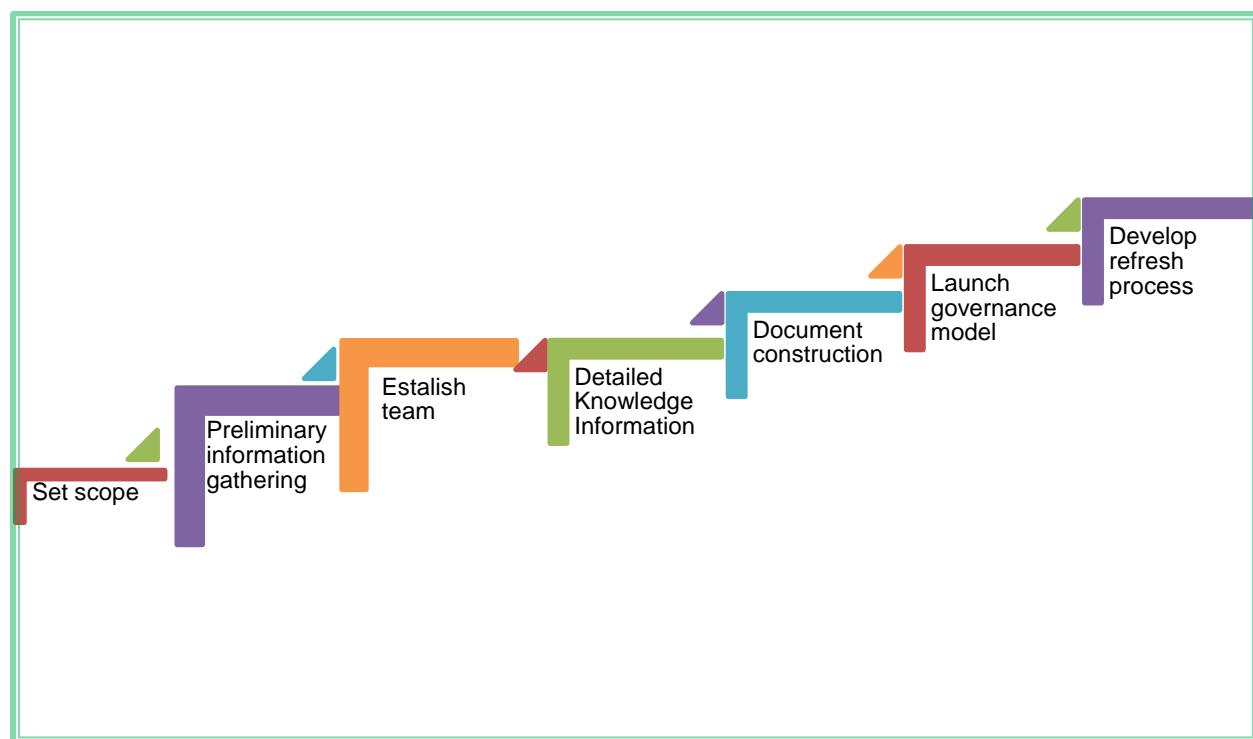
6.5   Planning for WSU IT Governance model development

The combination of the WSU IT Governance procedural steps and the ICT planning process (sections 6.3 and 6.4) helped in developing the WSU IT Governance planning process. This planning process follows a series of steps which are represented in this section as diagrams. The WSU IT Governance process satisfies the IT Governance goals and provides step-by-step

guidelines to ICT stakeholders on the process. This process has been simplified and is explained to ensure understanding among all ICT stakeholders.

6.6   IT Governance investigation process

The investigation process has to be conducted before the actual planning for the IT Governance model is done. There is a need to understand the current state of the ICT and to engage with the stakeholders. This creates a better understanding of IT Governance requirements at WSU and educates the stakeholders on the ICT practices. The major steps for this process are explained in Figure 6.3

Figure 6.2: WSU IT Governance Investigation Process: (22 Over7 Consulting Inc, nd)
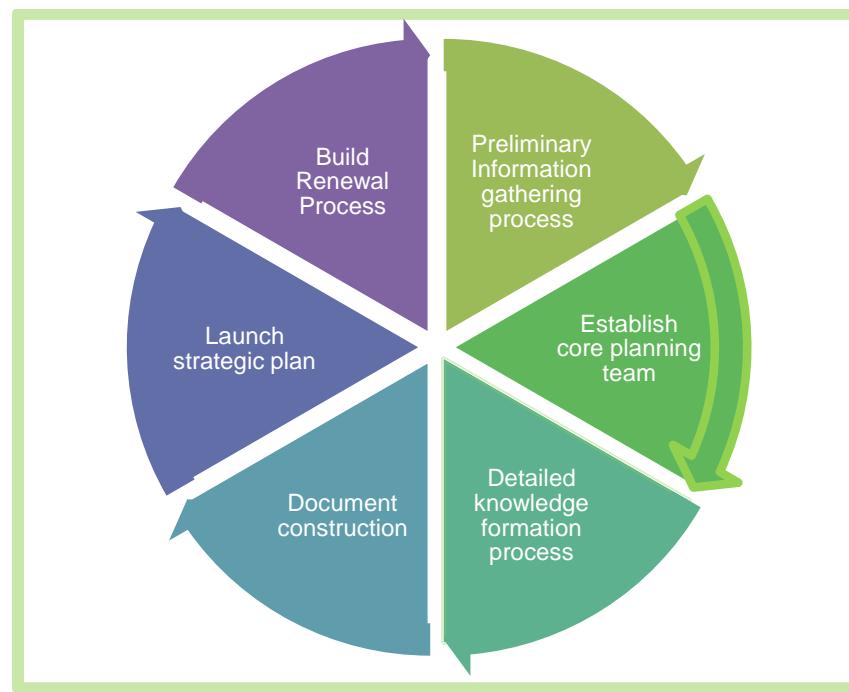
In order to ensure that this process works, there is a need to work with all stakeholders to:

i.   Establish scope of governance that identifies:

- Strategic institutional concerns and issues

- Key stakeholders

- Degree of current institutional engagement with ICT

- Institutional interest and enthusiasm for governance

- Preliminary information gathering process which helps to review the institutional key documents and all other relevant documents.

ii.   Establish core IT Governance project team and forums

iii.   Detailed knowledge information process

- Interview internal and external stakeholders

- Review potential models with core team

- Develop appropriate model for the institution

- Identify key ICT positions and appropriate individuals or roles to fill those positions.

iv.   Document construction

- Publish first IT Governance draft

- Conduct formal IT Governance comment review

- Review comments and write final IT Governance document.

v.   Launch IT Governance model

vi.   Develop process for ongoing refresh of IT Governance model.

6.6.1 IT Governance Planning

After carrying out the investigation, the next step is the planning process. This builds from the findings and final document produced in the investigation process explained in section 6.5.1. The IT Governance planning team has to be set up. Information gathering is also carried out and a strategic plan is put in place. Then an IT Governance planning document is produced. The details of the whole planning process are summarised in Figure 6.3

Figure 6.3: WSU IT Governance planning process (22 Over7 Consulting Inc, nd)

The planning process involves working with WSU stakeholders to:

i.   Establish scope of strategic plan that will cover:

- Timeframe for strategy
- Key stakeholders
- Integration with the broader institutional strategy
- Impact on operational planning, governance model, and staff performance goals.

ii.   Preliminary information gathering process

- Review key ICT documents
- Interview internal and external stakeholders.

iii.   Establish core planning team

- Detailed knowledge formation process
- Establish social media site
- Conduct broad consultation process
- Brainstorm key ICT themes with core team / forums.

iv.   Document construction

- Publish first draft

- Conduct formal comment review

- Publish second draft

- Review comments and write final document

- Launch strategic plan

- Develop process for ongoing refresh of strategic plan.

6.6.2 IT Governance – leading process

After planning for the IT Governance strategy, there is a need to appoint IT Governance leaders. These people are responsible for managing and leading all the activities. These are WSU employees from different levels within the management hierarchy of the university who ensure that the IT Governance plans are properly supported with the required ICT systems.

Figure 6.4: WSU IT Governance leading process (22 Over7 Consulting Inc, nd)
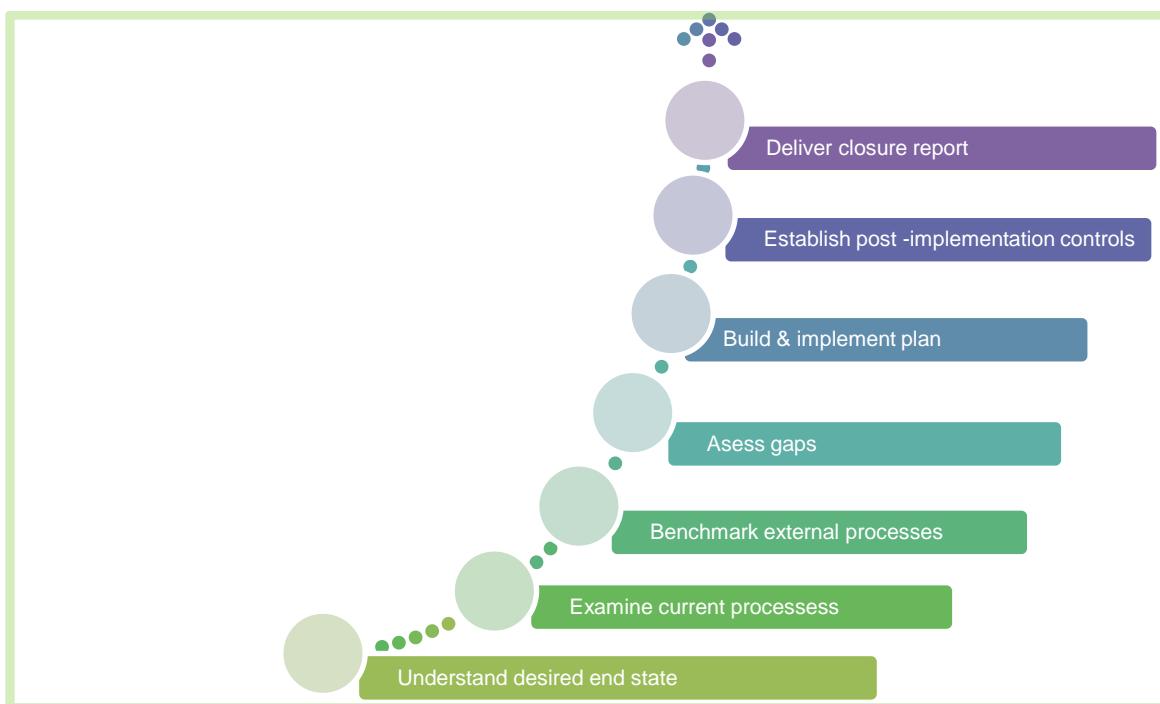
The WSU IT Governance leading process does the following:

- Delivers strategic and operational planning, development, evaluation, and coordination of the ICT systems in the university

- Provides leadership for ICT systems across the university

- Manages ICT staff

- Facilitates communication among staff, management, vendors, and other ICT resources

- Designs, implements, and evaluates new systems supporting clients throughout the university

- Ensures appropriate IT Governance processes are in place

- Establishes ICT ethics in the university.

6.6.3 WSU IT Governance changing process

The IT Governance leading process should enable the senior management to monitor the technological changes that are available. These changes should be analysed both internally and externally. The organisational development theories define different types fo change in section 3.6.9. The comparison to the current ICT environment and the proposed ICT changes is vital in enabling the closing of the gaps between the technological changes.

Figure 6.5: WSU IT Governance changing process (22 Over7 Consulting Inc, nd)

The IT Governance changing process requires the WSU stakeholders to do the following:

- Work with each other to understand desired end state

- Examine current processes within the university

- Compare ICT internal processes to similar processes in external organisations

- Re-visit desired end state based on internal and external ICT process analysis

- Assess gap between desired end state and current end state

- Build an ICT plan to move client to desired end state

- Implement an ICT plan and monitor progress

- Deliver closure ICT report to stakeholders and develop IT Governance model

6.6.4   WSU IT Governance assessing process

The WSU IT Governance assessing process follows from the changing process. The IT Governance assessing process provides a detailed assessment report that is used for the WSU IT Governance model development.
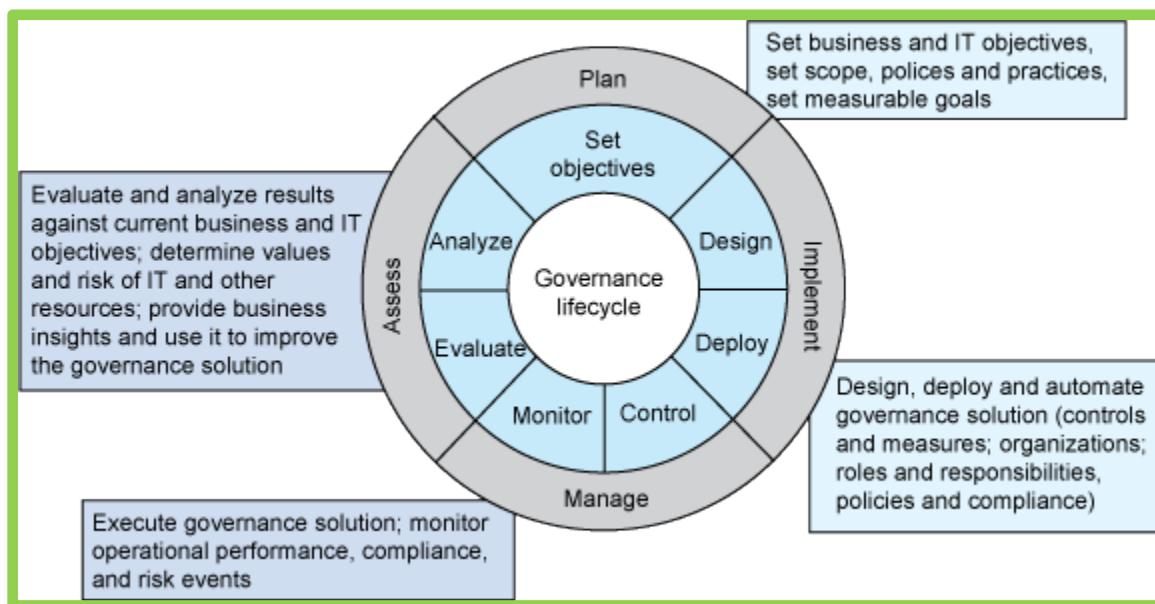
Figure 6.6: WSU IT Governance assessing process adopted form (22 Over7 Consulting Inc, nd)

The detailed IT Governance assessment process enables the WSU ICT stakeholders to achieve the following:

- Work with each other to understand desired end state

- Examine current ICT processes within the university

- Compare internal ICT processes to similar processes in external organisations

- Re-visit desired end state based on internal and external process analysis

- Assess gap between desired end state and current state

- Deliver specific recommendations for improving the university activities

- Make recommendations on the ICT needs which may cover:

    o University structure

    o University Financial ICT funding model

    o ICT process improvements

    o ICT and other university staffing updates

    o ICT system or technology changes

    o New ICT projects

After understanding the WSU IT Governance model, Figure 6.7 was designed. This shows a brief summary of the WSU IT Governance processes. The IT Governance life cycle model was developed by Cantor et al (2007) and this cycle is also used in this thesis to explain the WSU IT Governance model development process.

Figure 6.7: IT Governance life cycle model (Extracted from Cantor and Sanders 2007).

The governance lifecycle has four phases, as shown in Figure 6.7.

1. **Plan**

- Capture the governance requirement needs of the institution such as meeting compliance needs, policy adherence, providing better business values, or meeting service levels

- Determine financial and institutional responsibility for execution and testing of the solution based on the university requirements
- Determine those processes to bring under governance
- Determine the measures and targets of effectiveness of the governance solutions.

2. **Implement**

- Specify the decision rights, measures, and policies to be applied to those processes under governance
- Specify the automation and tool support
- Roll out the governance solution to the organisation in stages
- Monitor and measure
- Determine if the governance solution is meeting its effectiveness targets and make adjustments.

3. **Manage**
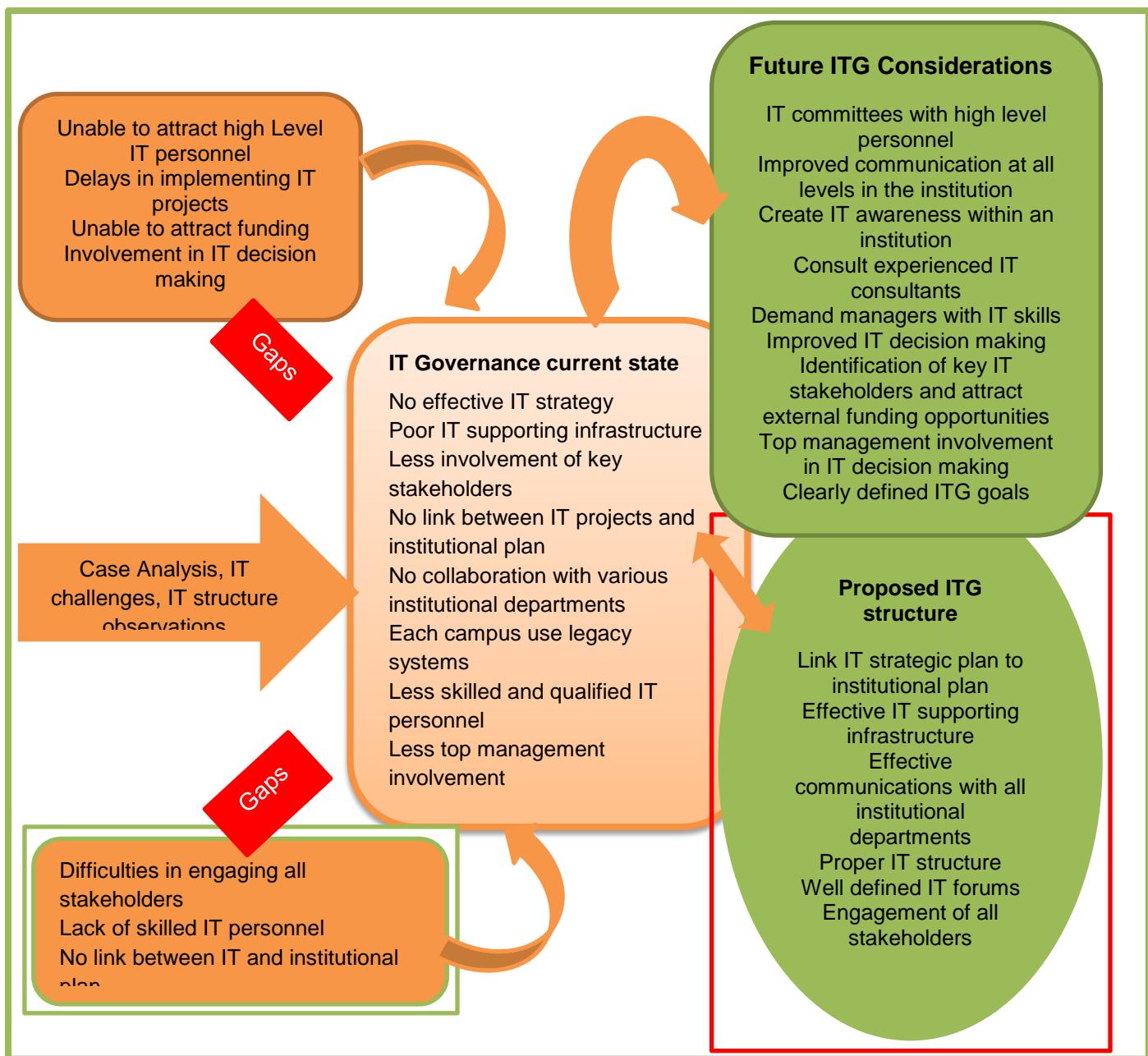
- Have the university execute a governance solution to obtain a baseline of experience.

4. **Assess**

- Collect governance effective measures
- Determine if the governance solution meets its effectiveness targets and make adjustments
- Analyse shortfalls to provide input to the plan phase of the next round of the lifecycle.

6.7   WSU IT Governance Model

Using the ideas discussed in the previous sections, the researcher proposed a general framework for the proposed IT Governance model. This IT Governance model is a generic idea that encompasses the current IT structure at WSU, the findings from the two benchmark universities and future ICT changes. This model proposes ideas that can be used to close the gap between the current ICT state at WSU with the benchmarked universities and future changes.

Unable to attract high Level IT personnel
Delays in implementing IT projects
Unable to attract funding Involvement in IT decision making

Gaps

Future ITG Considerations

IT committees with high level personnel
Improved communication at all levels in the institution
Create IT awareness within an institution
Consult experienced IT consultants
Demand managers with IT skills
Improved IT decision making
Identification of key IT stakeholders and attract external funding opportunities
Top management involvement in IT decision making
Clearly defined ITG goals

Case Analysis, IT challenges, IT structure observations

IT Governance current state

No effective IT strategy
Poor IT supporting infrastructure
Less involvement of key stakeholders
No link between IT projects and institutional plan
No collaboration with various institutional departments
Each campus use legacy systems
Less skilled and qualified IT personnel
Less top management involvement

Proposed ITG structure

Link IT strategic plan to institutional plan
Effective IT supporting infrastructure
Effective communications with all institutional departments
Proper IT structure
Well defined IT forums
Engagement of all stakeholders

Gaps

Difficulties in engaging all stakeholders
Lack of skilled IT personnel
No link between IT and institutional plan

Figure 6.8: Proposed IT Governance model
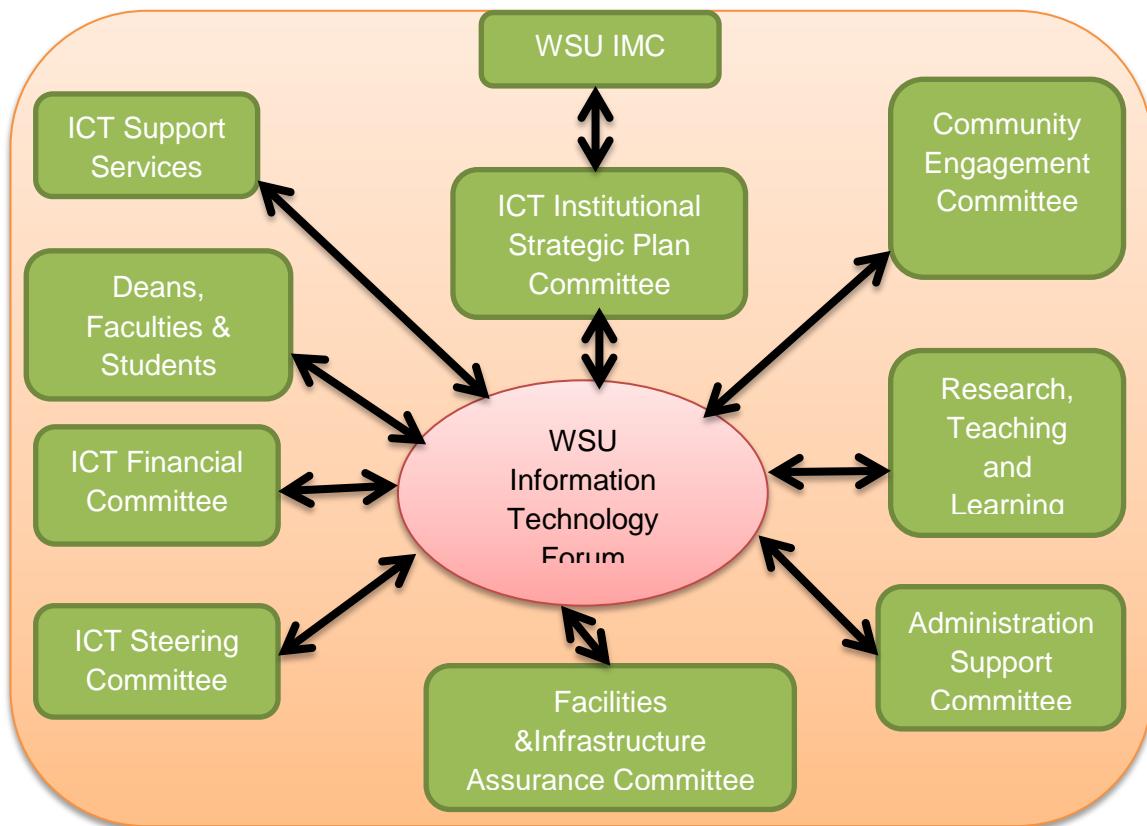
IT Governance Current Structure: This explains the WSU current IT Governance structure with its strategic plan. For this research the focus is mainly on the IT related challenges experienced. The researcher is of the opinion that there are some positive IT processes in place although it appears that the negatives processes outweigh the positives. More details on the current IT Governance structure at WSU have already been explained in Chapter 5.

Proposed IT Governance Structure: The proposed structure was based on the findings of the benchmarked universities and currently available IT Governance literature. This part of the model highlights new ideas that WSU could use in developing an IT Governance structure. The proposed ideas could improve the current state of the IT structure at WSU.

Gaps: Having considered the current WSU IT Governance structure and comparing it to the proposed IT Governance structure, some gaps were identified. These gaps explain some possible inhibitors that could discourage IT Governance development in general. In this research these gaps can be seen as any factor that could affect the effective implementation of the IT Governance at WSU. At this point the proposed IT Governance structure accommodates these factors and WSU could have a proper IT Governance structure.

Future IT Governance Considerations: This part provides a plan for the future IT Governance structure using the current IT Governance status at WSU, the existing IT Governance literature and the findings from the benchmarked universities. The future IT Governance considerations include the solutions that are proposed even for the benchmarked universities. Including these future ideas could improve continuity and sustainability of IT Governance for the case universities studied.

Proposed IT Governance model WSU
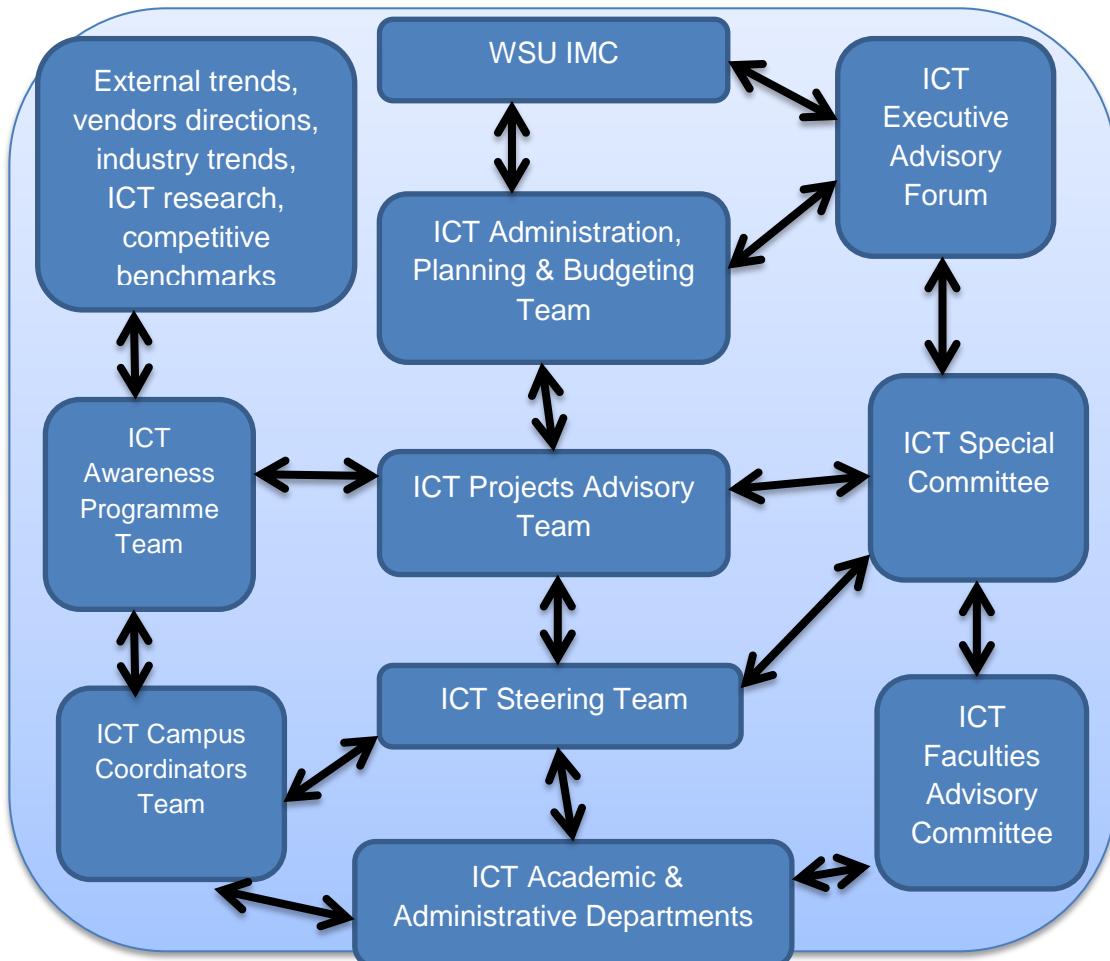
Figure 6.9: Proposed IT Governance model Version 1

WSU's proposed IT Governance model shows the areas that are addressed within the ICT structure. Various functionality which are included in this model identify the key areas the IT Governance addresses at WSU. The model shows that all the functionality interact with the WSU ICT Forum. There is a bilateral communication between all the functionality and the WSU ICT forum.

The model in Figure 6.9 is modified to illustrate an advanced and more specific version of the WSU IT Governance model; this is shown in Figure 6.10. The proposed IT Governance version 2 in Figure 6.10 shows that the external forces and ICT trends determine the ICT awareness campaigns. These awareness campaigns are run by the ICT awareness team in collaboration with ICT special committe and the presence of an ICT strategy advisory forum is indicated in this model. In addition there is a committee responsible for the sourcing and procurement of ICT resources represented by the ICT administration, planning and budgeting team which works closely with the ICT projects advisory team. The departments, academic and administration, and faculty board advisors are also proposed and these are responsible for communicating their special ICT needs and for ensuring that the ICT committees receive the necessary university

support. The ICT campus coordinators are also identified to present and communicate the ICT special needs for different campuses since WSU is spread across different campuses. The ICT steering committee is central to almost all the ICT committees in the university; its main role is to advise and communicate each committee's needs to the executive management of the university. The special ICT committee handles all the technical ICT issues for further recommendations.

Figure 6.10: Proposed IT Governance model version 2

The two versions of the proposed WSU IT Governance structures are intended to:

- better integrate IT strategic planning with campus strategic planning to the overall institutional strategic plan;

- set campus-wide priorities for IT services, resources, and facilities;

- provide guidelines and support for similar determinations at unit and departmental level;

- make decisions employing a campus-wide funding model still under development that rewards cost-effectiveness and discourages non-strategic IT spending.

Together, the various forums, committees, and faculties:

- serve as the collective communication links of WSU ICT strategic development

- represent the key areas of WSU's mission—teaching and learning, research and community engagement in all the university campuses

- oversee campus technology expenditures in support of WSU's core missions

- will strive to remove disincentives and institutional barriers to acceptance of shared services and infrastructure.

6.8   Specific findings for WSU

After developing a model the researcher found:

- The need for IT Governance awareness in the university community
  - WSU community is already aware of ICT benefits which makes it easier to engage them with ICT awareness programmes.
- It is difficult to engage all stakeholders at WSU –
  - Distance between campuses
  - Logistics in arranging successful meetings with the various departments at the different campuses.
- There are challenges of effective communication
  - Poor ICT infrastructure
  - Network not working effectively
  - Distance between campuses.

In order to best influence stakeholders, and communicate the major objectives and benefits of IT Governance, the right ICT language must be used. An inability to communicate effectively has been one of the major causes of ICT failures, along with too much technical jargon, lack of business understanding and poor appreciation of the other party's requirements, needs and concerns. Ideally, a common language is required, and a balance has to be found between the business trying to understand ICT and ICT trying to understand the business. Communications will improve if the business views the technology provider not as a simple enabler but as a valued business partner and if ICT presents benefits in the language that the business understands. The following are examples of some of the key messages that need to be

communicated, based on three primary IT Governance objectives and the related benefits that can be realised

- Need to upgrade the ICT infrastructure and network
  - Slow network
  - Outdated computer hardware and software
  - Lack and shortage of ICT skilled personnel.
- Difficult to attract financial aid to support ICT initiatives
  - University still has a long list of activities that compete with each other with little funding to achieve the university mandate.
- Initially IT Governance was not a main key objective of the executive management, however, after the appointment of the administrator the university is working towards finding its feet in establishing IT Governance; hence this model can effectively contribute towards that goal. This statement is supported by the comment made by the newly appointed Acting ICT Director.

Some examples of WSU goals are indicated here:

  - To review and design relevant undergraduate and strategic postgraduate academic programmes
  - To promote learner-centred teaching, active enquiry and critical thinking
  - To create an enabling environment that empowers staff and students
  - To establish linkages with institutions of higher learning and other relevant institutions, locally, nationally and internationally
  - To attract and retain high quality academic and support services staff
  - To provide and maintain appropriate and adequate infrastructure
  - To develop, adapt and apply appropriate technology.

The main goal of WSU is: **Transformation of WSU's Academic Enterprise**

These goals are important to understand as the IT Governance model ideas have to be linked to these objectives.

- Approximately 75% of computer laboratory infrastructure is outdated (based on the researcher's observations)
- Linking IT strategies with the university strategy
- High level commitment of WSU community IT Governance (There is support for the ITG plan by the WSU community) that convinced the researcher that a model was applicable

- o Obtain ideas from the assessor's and administrator's technical team on improving ICT infrastructure
- o Staff and students buy their personal computers and ICT accessories.
- Partnership with other institutions
  - o To find and exchange new and existing ideas.

6.9 Basic IT Governance Processes after design

Good IT Governance requires a good process by which decisions about IT priorities and asset allocation are made. The basic outline of the IT Governance process at WSU is:

- The WSU community may make requests for ICT services or products. Requests may be made to the relevant committee in the respective departments, faculties and campuses which will be further forwarded to the ICT steering committee. The IT steering committee will advise accordingly and further forward the request to the next relevant committee if it cannot be addressed at the ICT steering committee level.

- Requests are assigned to the appropriate advisory committee for their consideration.

- Advisory committees evaluate requests, prioritise them against the other requests and/or projects pertinent to their areas of concern, and approve small to medium projects. Large projects that the advisory committees deem to be worthy of consideration are forwarded to the ICT Executive Committee for decisions of funding and implementation.

- The Executive Committee makes decisions about large IT projects or priorities as well as provides oversight of all of information technology at WSU.

- The Office of Information Technology implements projects in accordance with the decisions made by the various committees involved in the decision process.

6.10 Assessing WSU IT Governance model

The IT Governance structure at WSU establishes the strategic, operational, and technical decision-making process necessary to ensure an innovative, reliable, and robust information technology. IT Governance provides strategic leadership, establishes campus-wide ICT priorities and policies in accordance with the University Strategic Plan, and is accountable to the University.

WSU's IT Governance framework should be administered by the IT Governance Executive Committee chaired by an IT expert. Key people who should be on the steering committee should be senior administrators who meet regularly and report to the other key stakeholders

frequently. The framework also includes several IT Governance advisory committees that meet regularly and provide input to the IT Governance Executive Committee.

The primary goals of the IT Governance are:

- To align WSU's direction with the University's Strategic Plan and the University's business priorities

- To create a snapshot of ICT systems and services on campus that is efficient, meaningful, effective and innovative, and

- To share awareness of the decision-making process that determines where ICT resources are applied.

These goals are accomplished by:

- Fostering a dynamic and direct partnership between WSU and its surrounding community

- Ensuring comprehensive and integrated ICT oversight, and

- Providing oversight led by senior-level members of the University community who are responsible for, and directly accountable to, their respective units or departments of the institution.

IT Governance Executive Committee: The IT Governance Executive committee is responsible for all major IT decision-making for the University and provides guidance as well as sets ICT priorities in harmony with the University's strategic goals and mission.

To ensure that significant opportunities for leveraging technology are considered, the ICT Governance Executive Committee receives input from the IT Governance advisory committees.

IT Governance Advisory Committees: IT Governance advisory committees are led by the most senior ICT person within in the university and can be co-chaired by the external ICT advisory board member and meet regularly to discuss ICT topics and prioritise ideas or ICT projects that will best serve their area of responsibility. The advisory committees make recommendations on strategy, funding, and policy to the IT Governance Executive Committee. In the future, the University also will engage the ICT expertise of representatives from industry, academia and governmental agencies through a new external advisory board.
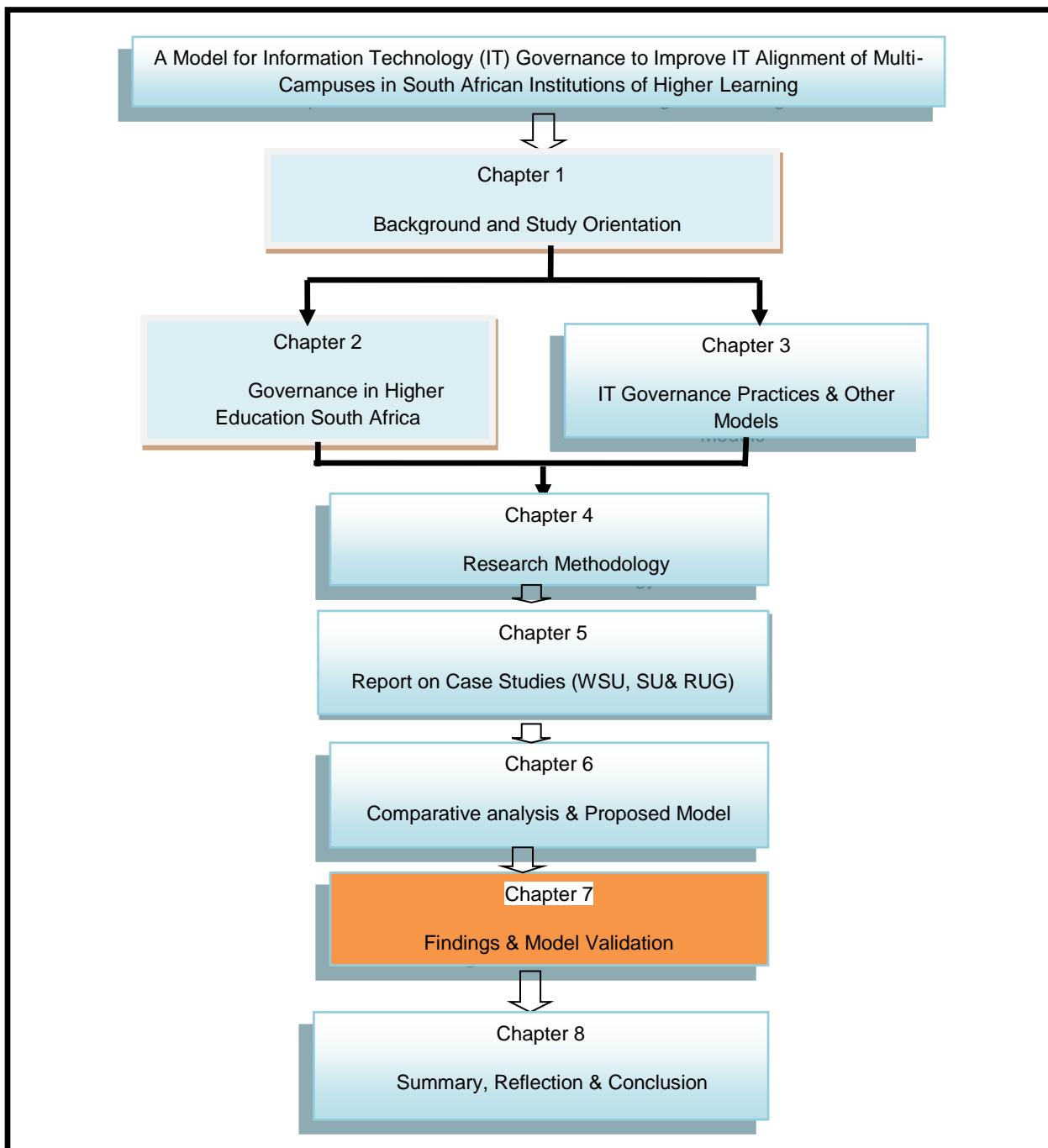
6.11 Chapter Conclusion

This chapter described the proposed WSU IT Governance model. The chapter explained the various processes, steps and key components that were considered for the IT Governance

model development. Furthermore, the possible benefits of the WSU IT Governance model were explained in this chapter.

Chapter 7: Diagram Overview

A Model for Information Technology (IT) Governance to Improve IT Alignment of Multi-Campuses in South African Institutions of Higher Learning

Chapter 1

Background and Study Orientation

Chapter 2

Governance in Higher Education South Africa

Chapter 3

IT Governance Practices & Other Models

Chapter 4

Research Methodology

Chapter 5

Report on Case Studies (WSU, SU& RUG)

Chapter 6

Comparative analysis & Proposed Model

Chapter 7

Findings & Model Validation

Chapter 8

Summary, Reflection & Conclusion

Chapter 7: Evaluation of the Model

7.1   Introduction

The proposed WSU IT Governance model explained in Chapter 6 describes the structure, components and key IT elements that have to be considered for WSU. However, there was a need to assess the proposed model through evaluation. The WSU IT Governance model was evaluated using a variety and combination of available resources at the time of the research. The existing literature review, existing IT Governance frameworks, current state of WSU IT structure and the visited case study universities were used to evaluate the WSU IT model. Samples of statements captured from the study chapters are used as key statements to evaluate the validity of the model.

7.2   Evaluating WSU IT Governance model using existing IT Governance literature

The area of interest of this study is IT Governance Strategic Alignment. Strategic alignment of an organisation is a management concept concerned with all stakeholders involved in the organisation (Weil and Ross, 2004), meaning that strategic alignment is a leadership concern.

Participation of the organisation's leadership is crucial when it comes to IT Governance because the leadership of an institution is the custodian of the institution's vision, mission, goals and objectives.

The involvement of the university executive management and participation of the university community in developing an effective IT Governance Model for WSU has been identified and explained as an important component of the model in Chapter 6, which confirms the validity of the model, and this is supported by Weil and Ross's definition of strategic alignment.

Five IT Governance focus areas play a vital role in the development and implementation of successful IT Governance. These focus areas are: Strategic Alignment, Risk Management, Resource Management, Value Delivery and Performance Management. Although they each have a specific role to play, these domains complement each other in the process of maintaining and/or establishing new IT Governance strategies for a specific organisation (IT Governance Institute, 2007c).

Out of the five IT Governance focus areas identified as vital role players in developing and implementing successful IT Governance, three of them (Strategic Alignment,

Resource Management and Value Delivery) are addressed in the WSU IT Governance Model. The three focus areas addressed in this study support the validity of the study as they represent 65% of the five focus areas. The validity of the other 35% of the focus areas can be addressed only after the Model has been implemented.

According to Milne and Bowles (2009), the strategic alignment domain includes understanding the needs of the business, developing IT strategy, determining resource allocation, managing resource demand requests, and facilitating IT to business communication.

The strategic alignment domains defined by Milne and Bowles are identified as main strategic alignment domains for the WSU IT Governance Model; this confirms and supports the validity of the Model.

Kordel (2004) states that in addition to integration of the future IT organisation with future enterprise organisation, strategic alignment also encompasses a state of harmony of these organisations.

Harmony in strategically aligning and integrating the IT plan into the university plan has been identified as an effective strategy in successfully developing a WSU IT Governance Model that addresses the university objectives as captured by Kordel (2004). This therefore confirms the validity of WSU IT Governance Model.

Successful IT and business alignment is informed by a satisfactory answer to the following questions (IT Governance Institute, 2005):

- Are we doing the right things?

- Are we doing them the right way?

- Are we getting them done well?

- Are we getting the benefits?

The above questions assist in identifying who is actually responsible for the strategic alignment between IT and the business management.

The WSU IT Governance Model addresses the questions suggested by the IT Governance Institute (2005) which confirms the validity of the model. The role of executive management of the university and all other important structures are clearly defined in the Model and further define different roles by different IT forums or structures within the university.

Different authors such as Ridley (2008), Sweden (2008) and Khan (2006) further indicate that IT Governance finds the balance and direction that satisfies organisational needs and obligations to ensure innovation and effectiveness of an organisation's departments. This therefore confirms that IT Governance is important for different types of organisations that extensively use and rely on IT for their daily operations because IT Governance introduces a transparency policy for the organisation.

The WSU IT Governance Model addresses the need for balance and direction that satisfies the obligation to ensure innovation and effectiveness by suggesting the IT Governance solutions that address the current and future improvement of the university IT structures, confirming the validity of the model.

7.3   Evaluation using existing IT Governance models

According to IT Governance Institute and Val IT based on COBIT (2007), Val IT and COBIT provide a one-stop credible and codified source, providing the overall governance framework and supporting processes to achieve effective governance. The role of these models is to guide organisations when they work with their IT governance processes.

The WSU IT Governance Model, like Val IT and COBIT is developed to guide the university in effectively handling and processing the institution IT Governance processes. The model further provides trustworthy and organised support in achieving the university mandate.

Luftman (2000) emphasises that the effectiveness of alignment needs collaborative work, support and understanding, trust, appropriate prioritisation and effective communication of business and technical environments by senior management of the organisation.

Collaborative work of university stakeholders and executive management and IT departments, appropriate prioritisation and effective communication have been identified as key components of effective development and implementation of IT Governance in the university and this is supported by Luftman (2000). This confirms the appropriateness of the WSU IT Governance Model.

i.   Capacity Maturity Model (CMM)

The CMM broadly refers to a process improvement approach that is based on a process model developed by the Software Engineering Institute (SEI) (Rouse, 2007). The CMM was initially developed for software engineering in delineating the characteristics of a mature and capable software process to be used for:

- Software process improvement, in which an organisation plans, develops, and implements changes to its software process

- Software process assessments, in which a trained team of software professionals determine the state of an organisation's current software process, determines the high-priority software process related issues facing an organisation, and obtains organisational support.

The WSU IT Governance Model has identified the current state of WSU IT Governance and thereafter suggests the proposed IT Governance structure based on the benchmarked cases and literature and then suggests future IT Governance considerations. The processes followed are all suggested for the purpose of planning, developing and implementing a good IT Governance process for the university. The same process has been captured by the Capacity Maturity Model, which confirms the relevance of the WSU IT Governance Model.

ii. Capacity Maturity Model Integrated (CMMi)

The CMMi is a process improvement approach which was developed by a group of experts by combining different source models into a single improvement model (Kulpa, 2010; Constantinescu and Jacob, 2004).

The educational WSU IT Governance Model was developed based on different inputs from different sources into one improvement model based on WSU IT Governance challenges, IT Governance practices from the benchmarked cases, IT Governance best practices and literature by different authors. Capacity Maturity Model Integrated is an existing and recognised model which has followed the same approach which WSU IT Governance Model has followed, confirming the relevance of the WSU IT Governance Model.

iii. Luftman Business-IT Alignment Maturity

Luftman Strategic Alignment Maturity Assessment provides an organisation with a vehicle to understand and identify opportunities for enhancing the harmonious relationship of business and IT (Luftman, 2000). The alignment maturity assessment checks if opportunities can be achieved by evaluating business-IT alignment in terms of where the organisation is and what it can do to achieve its objective (Luftman, Papp and Brier, 1999; Luftman, 2000; Luftman, 2003).

The WSU IT Governance Model provided the university with an approach for enhancing the harmonious relationship of the university processes and IT by identifying the current

state of the university IT systems and suggests where initial and future improvement of the IT systems can be initiated in order to achieve the university objectives. The alignment maturity assessment check followed for WSU IT Governance Model is supported by the Luftman Strategic Alignment Maturity Assessment which confirms the appropriateness of the WSU IT Governance Model.

The organisational development theories ODTs are important because they are helpful for assessing change by reveal why change occurs (the driving forces of change), how change will occur (the stage, scale, timing, and process characteristics), and what will occur (the contents of change, outcomes, and ways to measure it).

The WSU IT Governance Model is intended to apply change in the university by suggesting different phases of improving IT strategic alignment in achieving the university objectives, mission and vision.

7.4 Evaluation using the benchmarked universities

7.4.1 University of Groningen
Summary of RUG IT structure

Comments: The university students and staff have access to the Internet on campus and when not on campus because the university has connection to the wireless network. The students who are staying off campus have access to their private residence that connects to the university server at a minimal fee.

IT Governance is an institutional strategic topic which is supported from the executive management of the university.

Minimum access and availability of IT structure / infrastructure in the university is captured by the WSU IT Governance Model as an important component of employing effective IT Governance and IT processes in the university and this is confirmed by the comment made that access to IT systems at RUG is a priority because it is made available to the entire university community including students.

Awareness programmes are scheduled only when there is a significant change to the IT system, otherwise minor changes are always communicated via the university general communication tools, e-mail and electronic notice boards.

Awareness is identified and recommended as an important component of IT Governance in the WSU IT Governance Model and this is further confirmed by the findings at RUG. At

RUG awareness in general is part of the university plan that adresses all the university issues including awareness for IT programmes. This supports the importance and relevance of introducing awareness for the WSU IT Governance Model.

An IT budget forms part of the overall university strategic plan though IT is also budgeted in individual faculties, other university units and from the third stream funds available.

WSU IT Governance explains the importance of integrating IT budget into the overall university budget for the purpose of effective execution of IT activities within the university. A budget plan at RUG supports the WSU plan on an IT budget which confirms the relevance of the model.

The IT Strategic Plan is a key document which serves as a policy document, but the university does not have a specific document for IT Governance. However, there are IT policy documents for procurement of IT equipment, policy on acceptable use and access to university IT systems that do not address high level IT Governance issues.

The IT Strategy document has been identified as a key document for the university in the WSU IT Governance Model that can be used as a guiding or procedure manual for all IT strategic activities in the university. This is also supported by findings captured from RUG as highlighted in the above statement and adds value to the model and confirms its relevance.

The presence of Committee of representatives of various units within the University (RUG)

Two main strategic university documents were analysed, namely University of Groningen Strategic Plan 2010–2015 and the Multi-Annual Plan (Meerjareplan) ICT 2010–2014. The University Strategic Plan document highlights that IT is a strategic item at the University of Groningen continuing to evolve every time the university reworks its fundamental strategic issues. The university aligns and defines its IT strategy with research, teaching and learning and the regular IT facilities goals that maintain and strengthen the excellent position of the institution nationally and internationally.

WSU IT Governance Model supports the growth of the university IT Strategy by suggesting a future IT Governance Plan for the purpose of growing and improving the university IT Strategy and to strengthen the effectiveness of IT processes in meeting the university mandate of administration, research, teaching and learning. The suggestion of

IT growth in the model is supported by the vision of RUG as highlighted above, which confirms the relevance and validity of the WSU IT Governance Model.

7.4.2   Stellenbosch University (SU)
Key IT structure summary

IT Forums; the university has introduced a new IT Governance structure which hitherto has not been part of the old IT Governance structure.

The future plans of improving IT Governance and introducing new ideas in executing IT Governance at WSU are captured. The notion of introducing a future IT Governance plan refers to the IT Governance improvent plan highlighted in SU findings as an important element of IT Governance for their university, confirming the relevance of WSU IT Governance Model.

Awareness programmes for new IT systems at SU are scheduled based on the degree of complexity of the new system introduced; otherwise, if not complicated, staff and students teach or familiarise themselves with the new system.

The consideration of introducing an IT awareness plan is explicitly defined as an important component in the WSU IT Governance Model; this is supported by the literature and findings from SU, which confirm the value and relevance of the WSU IT Governance Model.

IT Development

Responsibility for the IT Division's portfolio of new projects, the analysis of information system needs, architecture, the design and development of solutions, project management, information security and the management of change as new solutions are implemented.

The employment of highly skilled personnel in the IT division, for the purpose of effectively executing and developing IT solutions for the university, has been identified as an important IT Governance pillar for WSU IT Governance Model. This is supported by the statement captured from the SU findings that highlights the level of responsibility of the IT personnel in executing IT developments and solutions in the university; confirming the relevance of the WSU IT Governance Model.

IT forums consist of the Director (Services and Operations), relevant managers, deans, and research, faculty and student representatives. The forum meets once per semester.

The representation of different university stakeholders in the forums that deal with IT related issues in the university has been identified as key for the university IT Governance structure in the WSU IT Governance Model; the same notion is also captured as an important area in the findings from SU, confirming the validity of WSU IT Governance Model.

The University's information technology systems and infrastructure are an essential and integral part of the University's teaching, research, community interaction and administrative activities. To ensure that the powerful infrastructure and systems are used optimally, critical investigations and analyses are undertaken continuously to make provision for proactive adjustments and extension.

The alignment of the IT plan and the university plan has been identified as a key component of effective IT strategy in establishing the relevant IT infrastructure and systems that will optimally support the entire university mandate in the WSU IT Governance Model. This notion is supported by SU findings regarding the effective IT structure and systems in achieving the core mandate of the univeristy; it therefore confirms the validity of the WSU IT Governance Model.

7.5   Evaluation using expert input by the WSU COO and acting ICT Director at WSU

Evaluation by the experts at WSU was done after the first draft of the model was developed. They were provided with a brief definition of a model and the evaluation sheet. The expert input contributed to a modified model to cover few processes that were missing in the first draft of the model. The expert feedback indicated that the research is addressing a fundamentally critical area. It further captured that although the approach might seem to be direct and operational, it carries the important strategic aspects and budget constraints of the tertiary environment as a totality that need to be closely considered. On the other hand, the experts felt that the benchmarking was done with institutions which are financially strong and rated highly compared to WSU. However, the experts' concerns regarding financial strength and different rating of the benchmarking institutions were addressed in the proposed execution guide of the model in Chapter 6. The model was proposed to be executed in phases since WSU IT Governance had many challenges as recorded in Chapters 2 and 5. The following areas of the model were evaluated.

- Simplicity of the model

The interpretation of the model, the flow of model processes and the step-by-step execution were found to be simple enough and clear for ICT managers to understand and follow. The flow of processes also satisfied the purpose of this model since it is intending to introduce a simplified version of the model suitable for the WSU environment. The step-by-step execution was also identified as simple enough to be understood by the users of the ICT systems in the university.

- Relevance to WSU ICT Practices

The model has been identified as having the potential to assist and guide WSU and other institutions of higher learning to develop a new IT Governance structure and improve the existing one. The feedback also indicated that basic IT Governance practices are well incorporated in the model to guide the process of developing, improving and maintaining the IT Governance structure of the institution of higher learning. The implementation guidelines as captured in Chapter 6 were found more relevant for WSU, however, it has been indicated that the strategic participation of different stakeholders should be defined explicitly for participants at different levels of the university. Leading to the implementation guideline of the model, the model has been found to be practical enough to be easily executed.

- Strengths and Weaknesses of the Model

An all-inclusive approach and wide stakeholder involvement of the model has been identified as a strength of the model. The proposed execution stages of the model were also identified as a strong foundation for establishing an effective IT Governance structure of the university. It has been also emphasised that for WSU the proposed model has been delivered in good time to be used as a base in developing WSU IT Governance structure since the development is part an important mandate given to the administrator deployed by the Minister of Education at WSU and the exercise is still at the very early stages.

Due to the current state of the financial strain at WSU some of the proposed processes can be compromised. The expert feedback also indicated that the benchmarking would be more effective if it were done with the universities that operate in conditions similar to those of WSU.

The overall feedback on the proposed model is positive, which confirms the validity of this study.

- Anticipated Further Research

The experts saw a possibility of extending this study into a new research topic whereby an IT Governance Implementation architecture can developed along with the development of a deeper sense of the ICT steering committee terms of reference.

7.6   General Strengths of the Model

The develoment of this model is informed by various IT best practices and standards, the literature and input from the benchmarked universities as defined in Chapters 3 and 5 of the study. The IT Governance best practices such as Luftman Strategic Alignment Maturity Assessment, COBIT, ODT and King III Report are used in the study to identify the current level of IT Governance in the case studies and serve as building blocks in developing a proposed framework.

The thesis does not discuss much of the ISO 38500 standards because they focus more on corporate governance. However, since the proposed model is generic enough to be used by all stakeholders, including the executive management of the institution, ISO 38500 ideas were borrowed for the evaluation of the model. ISO/IEC 38500:2008(E): **Corporate governance of information Technology, International Standards 1st Edition.**

In the evaluation process, the model incorporates the ISO 38500 ideas that indicate the need for a model to provide guidance to those advising, informing, or assisting institutional directors. This enables IT planning and decision-making to improve the IT Governance structure of the institution.

The developed model is applicable to all organisations, including public and private companies, government entities, non-profit organisations and applicable to organisations of all sizes from the smallest to the largest, regardless of the extent of their use of IT. This idea is also mentioned as one of the key points of the ISO 38500.

The proposed model advises and educates the IT department and the institutional stakeholders on their role of the use and implementation of IT strategies in the university for the purpose of using IT as an enabler to achieve the institution's mission and vision.

7.7   Contribution of the model to WSU

The contribution of the proposed model to WSU is further measured based on the Fernandez and Lloreus (2008) which captures IT Governance goals as defined by different authors. Table 7.1 lists different authors supporting the model and Table 7.2 outlines the IT Governance goals supported by the authors listed in Table 7.1. WSU ITG is integrated in Table 7.3 and 7.4

respectively. Table 7.3 includes WSU-ITG in Table 7.1 whereas Table 7.4 highlights the goals that are supported and not supported by WSU-ITG.

Table 7.1: ITG frameworks

R	V	E	CM	WR	UK	C	
						C	COBIT
					UK		JISC (United Kingdom)
				WR			Weill y Ross
			CM				Calder-Moir
		E					ECAR (EDUCAUSE)
	V						Van Grembergen
R							CRUE Researchers

Table 7.2: ITG frameworks linked to goals

R	V	E	CM	WR	UK	C	#	IT Goals from ITG4U
		E	CM		UK	C	1	Have a very clear idea of the vision and IT strategy for the whole university.
	V	E	CM		UK	C	2	Align the IT strategy and the institutional strategy (business strategy).
		E	CM	WR	UK	C	3	Reach IT objectives using an integral IT governance system.
	V		CM	WR	UK	C	4	Have a decision making structure aligned with the IT strategy.
	V	E	CM	WR	UK	C	5	Provide high level IT policies and procedures which comply with external laws and regulations and support international standards.
		E		WR	UK	C	6	Make IT decisions that are correctly reasoned and effective.
	V	E	CM	WR	UK	C	7	Know and achieve the return value on IT investment.
	V	E	CM	WR	UK	C	8	IT projects must achieve the planned goals.
	V	E	CM	WR		C	9	Define an IT architecture that will include process definition and system integration.
	V	E	CM	WR	UK	C	10	Acquire the necessary technology to fulfil the requirements of the institution.
	V				UK	C	11	Guarantee that the established ITs are working according to plan.
	V	E	CM		UK	C	12	IT based services must meet the level required by the users.
	V		CM			C	13	Know and manage IT associated risks.
	V		CM			C	14	Ensure that IT systems are flexible and agile in responding to future changes.
	V	E	CM		UK	C	15	Have adequate and sufficiently trained staff who can govern IT efficiently.
R							16	Incorporate respect for people and social and environmental values within the IT strategy.
R							17	Exchange IT experiences with other organisations and with society as a whole

Extracted from (Fernandez & Lloreus, 2008)

The proposed model satisfies most of the defined goals as explained by Fernandez and Lloreus, (2008). Evaluating the proposed IT Governance model using Fernández (2008)'s findings led to the inclusion of the WSU IT Governance plan. The findings and comparisons as noted by Fernández (2008) were not changed. Each of the 17 IT goals were compared against

the proposed WSU IT plan together with other existing IT Governance frameworks. In Table 7.3 WSU is compared with other ITG models.

Table 7.3: ITG frameworks with WSU-ITG

							C	COBIT
						UK		JSC (UK)
					WR			Weilly Ross
				CM				Calder- Moir
			E					ECAR (EDUCA USE)
		V						Van Grembergen
	R							CRUE Researchers
WSU – ITG								WSU - Proposed ITG

Table 7.4: WSU against other ITG goals

								IT Goals from ITG4U	
WSU- ITG			E	CM		UK	C	1	Have a clear idea of the vision of IT strategy for whole university
WSU- ITG		V	E	CM		UK	C	2	Align IT strategy and institutional strategy
WSU- ITG			E	CM	WR	UK	C	3	Reach IT objectives using ITG system
WSU- ITG		V		CM	WR	UK	C	4	Have a decision making structure aligned to IT strategy
WSU- ITG		V	E	CM	WR	UK	C	5	Provide high level IT policies and procedures
WSU- ITG			E		WR	UK	C	6	Make IT decision that are correctly reasoned and effective
WSU- ITG		V	E	CM	WR	UK	C	7	Know and achieve the return value on IT investment
WSU- ITG		V	E	CM	WR	UK	C	8	IT projects must achieve the planned goals
WSU-ITG		V	E	CM	WR		C	9	Define IT architecture
WSU- ITG		V	E	CM	WR	UK	C	10	Acquire the necessary technology required by the institution
		V				UK	C	11	Guarantee that the ITs are working according to plan
WSU-ITG		V	E	CM		UK	C	12	IT based services meet the user requirements
		V		CM			C	13	Know and manage IT associated risks
WSU- ITG		V		CM			C	14	Ensure that IT systems are flexible and responding to future changes
WSU- ITG		V	E	CM		UK	C	15	Have adequate and trained IT staff who can manage IT systems

	R							16	Incorporate respect of people and social environment in the IT strategy
WSU- ITG	R							17	Exchange IT experiences with other organisations and society as a whole

Using the initial findings of Fernández (2008), the WSU ITG plan was placed against the goals that satisfy the proposed WSU IT Governance plan. It can be noticed from Table 7.4 that there are some goals, for example goals 9, 13 and 16, which WSU cannot satisfy. The main reason is that the stated goals are not directly addressed in the current WSU proposed model that is using the current state of the proposed model. The current proposed IT Governance for WSU is more of an informative tool aimed at educating the WSU community to properly prepare for an IT strategic plan. It does not show the IT architecture that could be used as the researcher proposes a design of the IT Governance plan with different architectural ideas that could be useful in establishing the required IT architecture. This means that goal 9 is not met on the proposed WSU model.

For goal 17, i.e. Exchange IT experiences with other organisations and society as a whole, the researcher noted that this is one of the key elements which would enable the WSU IT Governance to work fully. The ideas from different universities, both in South Africa and internationally, form a major part of the successful implementation of WSU IT Governance plan. This idea is exemplified in the selection of case universities used in this research and certainly the findings from these case universities, as explained in Chapter 5, have proved useful in implementing a successful IT Governance plan at WSU. The researcher in the recommendation section mentions the issue of WSU engaging with other universities in an effort to learn from other institutions. As a result, meeting goal 17 is indicated in Table 7.2

The researcher also recalled the IT Governance frameworks which discussed in Chapter 3.

IT Governance spans the culture, organisation, policy and practices that provide for IT management and control across five key areas:

Alignment – Provide for strategic direction of IT and the alignment of IT with business in respect to services and projects.

Value Delivery – Confirm that the IT/Business organisation is designed to drive maximum business value from IT. Oversee the delivery of value by IT to business, and assess ROI.

Risk Management – Ascertains if processes are in place to ensure that risks have been adequately managed. Includes assessment of the risk aspects of IT investments.

Resource Management – Provides high-level direction for sourcing and use of IT resources. Oversee the aggregate funding of IT at enterprise level. Ensures there is adequate IT capability and infrastructure to support current and expected future business requirements.
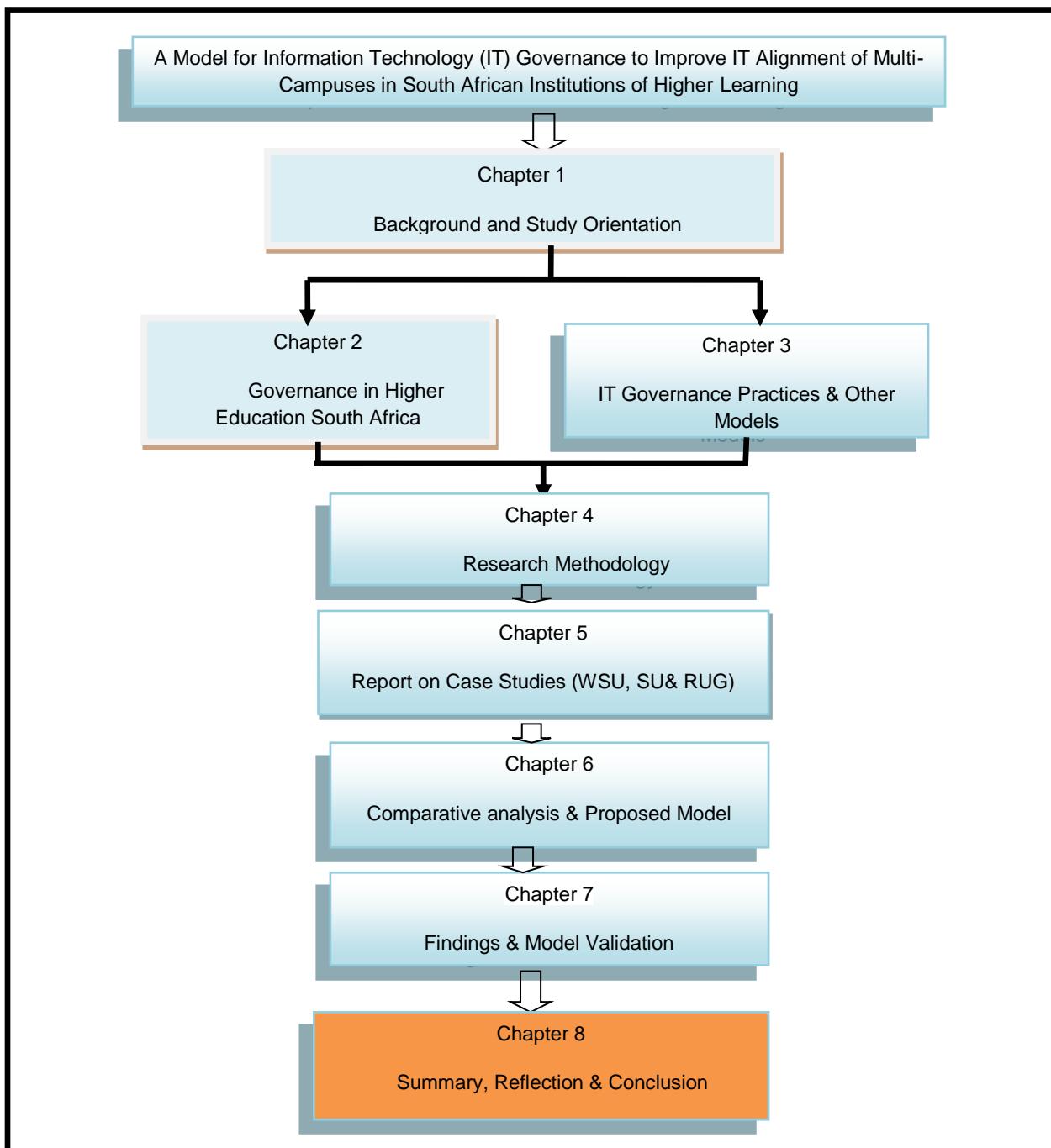
Performance Management – Verifies strategic compliance, i.e. achievement of strategic IT objectives. Reviews the measurement of IT performance and the contribution of IT to the business (i.e. delivery of promised business value).

The model satisfies three of the five criteria currently and the other 2 – risk management and performance measure – could be achieved once WSU staff understand IT structure.

7.8   Chapter Conclusion

In this chapter the proposed model for WSU was evaluated. The evaluation has been carried out through document analysis in which literature, existing best practices, and input from other universities used as benchmarked cases for this study have been used for the evaluation of the proposed model. The contribution of the proposed model to WSU based on Fernández's findings highlighted and confirmed the validity of the proposed WSU IT Governance model. The evaluation further identified the strengths and weaknesses of the model. The gaps highlight that the proposed model does not allow the institution to measure the performance of IT Governance because it requires complete implemantation of the proposed model. However, findings such as those of Fernández highlighted that more than 65% of the framework capture the strengths of the model.

Chapter 8: Diagram Overview

A Model for Information Technology (IT) Governance to Improve IT Alignment of Multi-Campuses in South African Institutions of Higher Learning

Chapter 1

Background and Study Orientation

Chapter 2

Governance in Higher Education South Africa

Chapter 3

IT Governance Practices & Other Models

Chapter 4

Research Methodology

Chapter 5

Report on Case Studies (WSU, SU& RUG)

Chapter 6

Comparative analysis & Proposed Model

Chapter 7

Findings & Model Validation

Chapter 8

Summary, Reflection & Conclusion

Chapter 8: IT Governance Achievements, Recommendations and Conclusion

8.1 Introduction

This is the final chapter of this thesis. It summaries the overall research focusing outlining research achievements and recommendations suggested for implementation in the WSU IT Governance strategy. The development of the IT Governance model for WSU was a direct response to the assessor report on WSU challenges which was officially published by the Minister of the Department of Higher Education and Training. IT Governance strategy was amongst the top items on the list of challenges at WSU. Another challenge that led to the development of the model was the first-hand challenge of poor ICT services, including ICT systems and personnel experienced by the researcher towards WSU ICT systems as described in Chapter 2 and Chapter 5. This chapter provides the answers to the research questions stated in Chapter 1, reflects on different items in a research basket and provides an overall research conclusion.

8.2 Research Overview

The answers to the research questions in meeting the objectives of this study were set out through eight chapters as outlined below and as indicated in Chapter 1. A literature study was conducted in Chapters 2 and 3 at the beginning of the study. The focus of the study in Chapter 2 was on gathering and understanding the literature that defined and described a generic governance structure of the institutions of higher learning in South Africa. The background of the composition of new higher education structure was defined for the research to gather rich information on the background of the establishment of WSU. In Chapter 3 the IT Governance best practices and other relevant models contributing and guiding the process of developing the proposed WSU IT Governance model were pondered. Different authors' views on IT Governance practices, processes and its positive and negative impact in their organisations were described. The methodological aspects that guided the research are described in Chapter 6. The research onion model was used to guide the process and provided the choices that were suitable for this study.

Chapter 5 of the study presented a report on different cases studied that describe each case's IT Governance structures and the challenges and success stories of the IT Governance practices in the respective cases. The understanding of IT Governance structures in these respective cases could directly address the sub-question of the study that seeks to understand

how the IT Governance is structured and implemented in different cases studied. The results of gathered information in this chapter subsequently contributed towards the comparative analysis in Chapter 6.

The discussions that took place in Chapter 6 were directed at learning and understanding the common and different IT Governance approaches used in different cases for the purpose of establishing an informed foundation that would contribute to developing a proposed IT Governance model for WSU. At the end of this chapter the proposed IT Governance model was developed which satisfies and addresses the main aim of this study and answers the question that seeks to understand how the IT Governance model can enhance the strategic alignment of IT with the university strategic goal. Chapter 7 focused on evaluating the model based on literature in Chapters 2 and 3, and in Chapter 5 where findings from different cases were presented and furthered captured in the comparative analysis of studied cases leading to the proposed model. The model was also evaluated using the expert feedback. This chapter, the last chapter of the study focuses on proving a conclusion to the study as discussed in section 8.1. A reflection is undertaken to investigate if the research study answered questions and the research process undertaken.

8.3   Reflection on the research questions and research process

The interpretivism philosophy was used in the research process to answer the research questions. This philosophy was evaluated based on Klein and Meyers' (1999) principles as described in the methodology chapter. The relevance of these principles in this study are outlined and described in Table 4.4 in Chapter 4.

The reflection on the research questions and research process is reported based on some critical questions that are significant to the study.

- Was the research methodology chosen the best in answering the research question?

The qualitative approach was used to answer the research questions and process of this study. It best fits the study because this study produces findings not arrived at by means of statistical procedures or any other means of quantification and does not follow a fixed woven plan, but collected data from different people in different cases. The study adopted an inductive approach to develop a proposed model which was built up from the broader themes of different cases studied by using different methods of data collection. The relevance of the adopted approach is described in detailed in section 4.3.1.

- How was validity and reliability implemented in the study?

This study adopted a data and methodological triangulation to collect data through the qualitative data collection technique. A literature review was carried out to inform the study and validate the model whilst an evaluation sheet was used to gather feedback from the experts in evaluating the model. The third form of triangulation in this study was the method of data analysis triangulation since it has adopted different data analysis methods as described in section 4.8.

- Was the case study approach the most suitable approach for the study compared to other approaches?

The case study approach enabled the researcher to investigate the concept of IT Governance practices from different institutions of higher learning to build up a comparative analysis leading to the development of the proposed IT Governance model for WSU. The case studies selected for this study were restricted to the institutions of higher learning to investigate the contextual realities by investigating parts of the universities that addresses the IT Governance practices. The experts who participated in the research were identified based on the merit of their relevance to the environment of the research topic which made the case study approach more relevant for this study compared to other research approaches.

- Was the sample that was used in this research study justifiable?

The triangulation of data collection was used to gather enough data for this study through literature review, interviews, observation, questionnaire, data analysis and feedback from experts. Therefore the proposed model was provided based on data was elicited from these different techniques which convinced the researcher that the sample used for this study was appropriate.

- Were the research questions answered?

This question carries more weight for a research study because if it is not addressed the research is deemed to be incomplete. The study had four research sub-questions presented in Chapter 1 of the study which were established to contribute in answering the main research question. The question seeking to check if the research questions were answered is presented in the following section 8.4.

8.4   Achievements

The proposed WSU IT Governance model promotes effective, efficient and acceptable use of ICT in an institution by:

1.   Assuring that all stakeholders effectively communicate so as to benefit from IT Governance

- informing and guiding executive management in governing the use of IT within the institution.

2.   The proposed model contributes positively to the performance of the institution, through:
- appropriate implementation and operation of IT assets
- alignment of IT with institutional needs
- good practice in relationships with stakeholders
- actual realisation of the approved benefits from each IT investment and institutional mandate.

3.   Transparency and Accountability
- Improved transparency of IT costs, IT process, IT portfolio (projects and services)
- Increased transparency will raise the bar for performance, and advertise that the bar should be continuously raised.

4.   Opportunities and Partnerships
- Provide route to realise opportunities that might not receive attention or sponsorship
- Positioning of IT as a business partner (and clarifying what sort of business partner IT is)
- Facilitate more businesslike relationships with key IT partners (vendors and suppliers).

The developed model satisfies one of the IT Governance definitions by Shuptar (2012): simply stated, IT governance is defined as establishing chains of responsibility, authority, and communication to empower people. The key concepts of this definition are found in the mnemonic RACE:

- *Responsibility* – being held accountable for a specific duty, task, or decision
- *Authority* – the power to influence behaviour
- *Communication* – exchanging information
- *Empowering* – giving official authority to act.

This definition is achieved since the proposed model highlights the need to assign responsibilities to WSU staff and give powers to all those involved in the IT Governance structure. These powers should include power to educate and conduct IT Governance awareness campaigns at the institution. This enables effective communication and empowers the WSU community with IT Governance knowledge.

The other achievements of this research include solutions to the initially identified research questions and also the meeting of the research objectives as explained in this section. This section presents the main research question and the sub-questions.

Main Research Question: *How can a model for IT Governance improve the implementation of the alignment of business and IT strategies for Walter Sisulu University?*

The main research question was addressed through a series of research actions undertaken during the course of the research. The researcher used other case universities to identify important components required to develop a working IT Governance model. The IT Governance model can improve WSU by:

- Engaging all the key WSU stakeholders

- Involving all the senior management in IT planning process

- Identifying the WSU objectives and IT Governance goals

- Having a clear understanding and awareness of the IT Governance benefits

- Learning from other institutions how IT structures are developed

- Developing a well-documented IT Governance model to use for WSU IT strategy as explained in Chapter 6.

The strategies used in this research were also critical in answering all the research sub-questions. For example, all the sub-questions 1–4 given in this section were answered after the development of the WSU IT Governance model.

Sub-question 1: How has IT Governance been approached in general?

Sub-question 2: How is IT Governance currently implemented at WSU?

Sub-question 3: How is IT Governance structured and implemented at benchmark academic institutions of higher learning in South Africa and internationally?

Sub-question 4: What are the components necessary to develop an IT Governance model specific to the multi-campus delivery sites of an institution of higher learning?

The proposed WSU IT Governance model in Chapter 4 shows the different approaches that can be used to develop an IT Governance model, thus addressing sub-question 1. Chapter 5 gives an overview of the current IT developments, plans and challenges at WSU and this addresses sub-question 2. The other IT structures at Groningen University and Stellenbosch University also explained in Chapter 5, answer sub-question 3. Chapter 6 covers the various components, techniques and the key issues to consider in developing an IT Governance model. The details in Chapter 6 provide answers to sub-question 4.

Research Objectives: The main objective of this study is to establish a model that enhances the alignment of IT to the strategic objectives of the institution. This research has provided an IT Governance model that could be used at WSU to align the University objectives and the proposed IT Governance goals.

The other research specific objectives as earlier mentioned in Chapter 1 are to:

- Investigate literature on IT Governance's best practices and IT Governance in general

- Investigate the validity and the extent to which IT Governance is currently utilised at WSU

- Investigate the IT Governance established international and South African institutions of high learning to identify how they manage their IT Governance for multi-campuses effectively, and to confirm their strengths and weaknesses

- Examine the general IT Governance and best practices that will be used as a base in developing a proposed model

- Build an augmented theory based on a comparative study of the institutions studied

- Develop an IT Governance model with specific focus on alignment for the purpose of improving service delivery of WSU multi-campuses.

The research successfully met all these objectives. The final section of Chapter 1 clearly shows the exact sections in this thesis in which these objectives were met.

8.5   Recommendations

Having conducted this research using three case universities, the researcher obtained different ideas and a better understanding of how to successfully draw up an IT Governance model. The proposed model is a good stepping stone for the WSU IT structure. Most of the ideas that are essential for the WSU community to benefit from through the proposed IT Governance model, are presented in Chapter 6. However, the research provided further recommendations for the proposed WSU IT Governance model. They are to:

- Implement the IT Plan as mentioned in the turnaround strategy document by achieving and implementing an IT budget into the overall university strategic plan.

- Establish IT awareness campaigns throughout the university. These campaigns encourage effective communication and empower the WSU community with IT knowledge which is vital for the IT Governance plan. IT forums could also be useful in creating IT awareness.

- Involve all relevant stakeholders in developing the university IT Strategy. The stakeholders can be both internal and external. Including all the relevant stakeholders improves the success of the IT Governance model and also encourages awareness. Various stakeholders bring in new ideas and this improves the IT Governance sustainability.

- Create a well-documented IT Strategy document i.e. a proper IT organogram with all the stakeholders represented. The documentation is important at every stage for referral purposes and also to allow new stakeholders at WSU to clearly understand the IT Governance strategy. As indicated in Chapter 6, after every IT Governance process, a document is required.

The need for WSU senior management to be involved in the IT Governance process enabled the researcher to state recommendations specifically for the WSU executive management. These recommendations include the need for WSU top management to:

- Consider the external or internal pressures acting upon the business, such as technological change, economic and social trends, and political influences.

- Take account of both current and future business needs – the current and future organisational objectives that they must achieve, such as maintaining competitive advantage, as well as the specific objectives of the strategies and proposals.

- Encourage a culture of good governance of IT within the institution by requiring managers to provide timely information, to comply with direction and to conform with the six principles of good governance.

- Monitor, through appropriate measurement systems, the performance of IT. They should reassure themselves that performance is in accordance with plans, particularly with regard to business objectives.

- Direct that IT assets (systems and infrastructure) be acquired in an appropriate manner, including the preparation of suitable documentation, while ensuring that required capabilities are provided.

- Direct that policies are established and enforced to enable the organisation to meet its internal obligations in its use of IT and direct IT staff to follow relevant guidelines for professional behaviour and development.

- Understand whether the infrastructure underpinning today's and tomorrow's IT (technology, people, processes) is capable of supporting expected business needs.

Finally, there is a realisation that because IT is complex and has its own fast-changing and unique conditions, the need to apply sound management disciplines and controls is even greater.

8.6   Further research

The full implementation of the WSU IT Governance model is required. Various university stakeholders should meet to discuss the need for IT Governance and the researcher wishes to use the model for the benefit of the university. The University Executive should buy into the IT Governance model idea and initiate the IT Governance process. The other issue to consider for further research is to have IT Governance workshops with IT experts to evaluate the IT Governance model.

8.7   Research Summary

A primary challenge impacting the successful delivery of IT programmes is the need to manage a broad set of stakeholder communities, including agency leaders, business process owners, IT, acquisition, financial management, and legal sources . Actively designing governance involves senior executives taking the lead and allocating resources, attention, and support to the process. Not only does overall governance require active design, but each mechanism also needs regular review. One goal of any governance redesign should be to assess, improve, and then consolidate the number of mechanisms. Early in the learning cycle, mechanisms may involve large numbers of managers. Typically, as senior managers better understand IT value and the role of IT, a smaller set of managers can represent enterprise needs.

IT Governance is not a one-time exercise or something achieved by a mandate or set of rules. It requires a commitment from the top of the organisation to instill a better way of dealing with the management and control of IT. IT Governance is an ongoing activity that requires a continuous improvement mentality and responsiveness to the fast changing IT environment. IT Governance can be integrated within a wider Enterprise Governance approach, and support the increasing legal and regulatory requirements of Corporate Governance. This WSU proposed IT Governance model was produced by analysing several IT Governance frameworks and specific models from benchmarking universities. The WSU IT Governance model aims to equip WSU stakeholders with better knowledge that is necessary to build a sustainable IT Governance structure.

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Annexure

Annexure A-1

University of Fort Hare

DEPARTMENT OF INFORMATION SYSTEMS

East London Campus:
P.O. Box 7426, East London, 5200, South Africa
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University of Fort Hare
Together in Excellence

8th March 2012

NUFFIC BURSARY – Ms Tembisa Ngqondi – Data collection at University of Stellenbosch and University of Groningen, Netherlands

Dear Sir/Madam,

The problem statement addressed in this study is that there is no clear IT Governance Strategic Alignment policy addressing the efficacy aspect which manages the alignment of IT infrastructure in multi-campuses at WSU. Therefore the main deliverable will be developing an IT Governance Model for a merged institution with multi-campuses using a comparative study of the findings obtained from reviewed literature and IT Governance of other institutions used as case studies. The proposed model for WSU will be benchmarked with the other two established institutions of higher learning -- one in South Africa (University of Stellenbosch) and internationally (Groningen University, Netherlands). Having consulted with experts in the field, Stellenbosch University has been identified as one of the top institutions with good IT Governance and also have multi-campuses in South Africa. Literature for University of Stellenbosch and Groningen University regarding IT Governance on campus will be reviewed; however, most data will be gathered from data collection collected by the researcher.

Therefore the researcher will conduct case study research at University of Stellenbosch and at Groningen University in the Netherlands to collect data from the following participants: information technology directors or managers that are responsible for the IT Governance strategic plan who will be interviewed. The integrity of data and subsequent findings will be secured through the deployment of appropriate ratification techniques. Obtaining informed consent from all participants and anonimity will be guaranteed. As supervisor I support Tembisa to do the data collection in April at Groningen University, Netherlands.

Regards

Prof ME Herselman (Adjunct Professor – Department of Information Systems) and supervisor

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Annexure A-2

University of Fort Hare
Together in Excellence

ETHICAL CLEARANCE CERTIFICATE

Certificate Reference Number: HER011SNGQ01

Project title: **A model for Information Technology governance to improve Information Technology alignment of multi-campuses in South African institutions of Higher Learning**

Nature of Project: PHD

Principal Researcher: Tembisa Ngqondi

Supervisor: Prof M Herselman

Co-supervisor:

On behalf of the University of Fort Hare's Research Ethics Committee (UREC) I hereby give ethical approval in respect of the undertakings contained in the above-mentioned project and research instrument(s). Should any other instruments be used, these require separate authorization. The Researcher may therefore commence with the research as from the date of this certificate, using the reference number indicated above.

Please note that the UREC must be informed immediately of

- Any material change in the conditions or undertakings mentioned in the document
- Any material breaches of ethical undertakings or events that impact upon the ethical conduct of the research
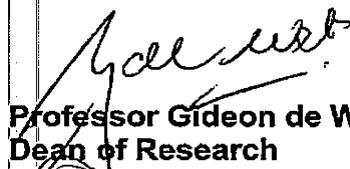
The Principal Researcher must report to the UREC in the prescribed format, where applicable, annually, and at the end of the project, in respect of ethical compliance.

The UREC retains the right to

- Withdraw or amend this Ethical Clearance Certificate if
    o Any unethical principal or practices are revealed or suspected
    o Relevant information has been withheld or misrepresented
    o Regulatory changes of whatsoever nature so require
    o The conditions contained in the Certificate have not been adhered to

- Request access to any information or data at any time during the course o after completion of the project.

The Ethics Committee wished you well in your research.

Yours sincerely

Professor Gideon de Wet
Dean of Research

28 October 2013

Annexure A-3
Pool of Questions for different Structures

No	Candidates	Questions
1.	ITC-IT – Committee that checks if the IT submissions for funding are aligned with the institution mission and vision.	1. Which strategies do you use to check if the submission from faculties and service departments for IT functions are aligned to the institution mission and vision? Or how regularly do you check? 2. If you can rate these strategies in the scale of 1 (less effective) – 5 (highly effective), to check its effectiveness; where can you score it. 3. How do you rate the urgency of the IT submissions that meet your requirements for implementation? 4. According to your procedures what defines the most urgent submission? 5. What is your role in assisting the faculties and service departments in aligning their IT plans with the institution mission and vision? 6. Do you have a procedure manual that guide the faculties and service departments in aligning their IT strategies with the strategies defined by your committee? 7. Which awareness programmes do you have to empower faculties and service departments with set procedures? 8. Which strategies are used to assist all the IT submissions to be implemented at the most reasonable time? 9. How often do your review the IT procedure manual? 10. How effective in the scale of 1 – 5 is the IT procedure manual achieve effectiveness of achieving its goal? 11. How do the IT recommendations processed in your committee fit in with the overall IT strategic plan. 12. What is the link between your committee and the IT strategy committee?
2.	ICTC – Is a committee where all support services departments with an ICT component meet to discuss their plans within their specific units. They meet so that they can submit jointly to the ICTO. ICTO – Is a committee where three members from ICTC meet with a member from CvB – Executive Board (Rectorate) to present the ICTC submission.	1. Which strategies do you use to decide on items that need to be integrated? 2. Which strategies/procedures do you use to agree on the level of acceptable on overlap? 3. How does the decentralisation of IT contribute positively and negatively into the institution's operations? 4. How do you check if the faculties' submissions/requests are aligned with the institution mission and vision? 5. How effective does this structure work for the institution? 6. What is the role of the CvB on institutionalising your submission?

No	Candidates	Questions
3.	Center for Information Technology (CIT) – Educational support & Innovation and (CIT) – Technical Support	1. How do you design ICT programmes for improving research, teaching and learning? 2. What informs your decision in introducing new ICT tools for research, teaching and learning? 3. How are your ICT projects linked to the institution's strategic plan? 4. How are the ICT initiatives for research, teaching and learning communicated to the faculties? 5. What is the role of faculties regarding ICT projects? 6. How do you maintain the ICT infrastructure? 7. How do you manage the bandwidth challenge in your institution? 8. Which strategies do you use to achieve acquiring good IT resources and infrastructure in your institution?
4.	College of Deans – Heads of faculties.	1. What is the role of college of deans into the development and implementation of IT strategies within their faculties? 2. How do you monitor the effectiveness of ICT into the faculty functions? 3. When is the Faculty ICT plan reviewed? 4. Who is responsible for the development of the faculty ICT plan and strategies? 5. What is the role of deans in identifying the IT needs in their faculties? 6.
5.	Demand Managers – liaison person between the faculties and service department on facilitating the faculty requirements on general IT.	1. What strategies do you use to collect relevant generic IT information from the faculties? 2. What procedures do you use to get feedback/input to the faculties? 3. What is the involvement of deans to this function? 4. Which activities/services do you classify as general IT? 5. How are the general IT functions/services linked to other IT services other than the ones classified as general activities? 6. How do you document and report these general services to the CIT department? 7. In the event of common generic IT services from different faculties how are requests communicated to the CIT? 8. How does the task of a demand manager improve the service delivery in the faculties? 9. What are challenges and opportunities of having a demand manger in the faculty? 10. How is the staff response on the demand manager's request?

No	Candidates	Questions
		11. How do you communicate and educate staff on their role in responding to the demand manager's call for input?
		12. Is a demand manager employed to specifically coordinate the general IT needs on the faculty or/ and maybe have some other responsibility attached to him/her in the faculty?
		13. If it is a position, what is the level of this position in the faculty?
		14. Does a person have to be a specialist in IT to get this position?
6.	CIT Staff	1. What is your involvement in developing IT strategies and policies that promote the effective research, teaching and learning environment?
		2. As service department to the institution community, how prompt is your department in providing support for lecturers, students and administration staff?
		3. How do you respond to the industry changes regarding ICT?
		4. How do you work with suppliers regarding outsourced services and warranty contracts?
		5. What types of challenges do you often experience when it comes to achieving your IT projects?
		6. How do you educate the users about the importance of protecting and complying with ICT policies?
		7. How do you establish and maintain your working relationship with the users?
		8. Identify the strengths and challenges of your department.
		9. How did strengths and challenges contribute positively and negatively to your services?
		10. How effective is your ICT approach into achieving the institution's mandate of research, teaching and learning? Support your answer.

Annexure A-4

Indicate by putting "X" next to the correct answer regarding the following statements. Mark one answer for each statement such as Yes (Y) or No (N)	Y	N
1. There is unlimited access to the computer laboratories.		
2. Computer laboratories are connected to the network.		
3. Internet access is unlimited in the computer laboratories.		
4. There are computer laboratories dedicated tor practice, research, assignments and homework over a twenty four hour period.		
5. Computers in the laboratories and offices use current and updated application software and hardware.		
6. There is access to the printers in the computer laboratories.		
7. Printers are connected to the network and can be shared by students and staff in different venues.		
8. Real-learning application software such as wise-up, blackboard etc. are installed in the computer laboratories.		
9. IT systems enable students to use real-learning software effectively.		
10. Students and staff have e-mail and Internet accounts.		
11. Internet and e-mail is available and accessible in the students' residence.		
12. Computers in laboratories always work effectively.		
13. Students and staff can connect their personal equipment such as laptops, iPads etc. to the university network.		
14. During practical lessons, the ratio of computers and students in the computer laboratory is 1:1 (every student has his/her own computer).		
15. The university has an IT Strategic Plan that addresses the needs of the university stakeholders.		
16. The university has a good IT Governance policy.		
17. The university has IT Forums that address IT Governance related issues.		
18. There is a good partnership between the IT Department, industry and all other sections in the university.		
19. The IT Department schedules awareness programmes for all new developments such as changes in software, infrastructure and IT policies.		

Indicate by putting "X" next to the correct answer regarding the following statements. Mark one answer for each statement such as Yes (Y) or No (N)	Y	N
20. The university budgets for IT Projects in the central university budget plan.		
Comments:		

Annexure A-5

INFORMATION LEAFLET AND INFORMED CONSENT

PROJECT TITLE: A MODEL FOR INFORMATION TECHNOLOGY (IT) GOVERNANCE TO IMPROVE IT ALIGNMENT OF MULTI-CAMPUSES IN SOUTH AFRICAN INSTITUTIONS OF HIGHER LEARNING

Primary Investigator: Ms.Tembisa G Ngqondi, E-mail: tngqondi@wsu.ac.za, tel: +27437085445, fax: +27866654707

Supervisor: Prof. MarlienHerselman, Email: mherselman@csir.co.za, tel: +2712 8413081, fax: +2712 8414720

Dear Research Participant,

I am asking for your voluntary participation in research study leading to a fulfilment of requirement for my PhD in Information Systems studies. This information leaflet is to help you fully understand what is involved in the study and thereafter, decide if you would consider participating in it.

Purpose of Research:

This study is carried out to evaluate and understand the level of IT Governance strategic alignment in the institutions of higher learning. The questionnaire has been developed based on the Luftman's Strategic Alignment Maturity Model and CobiT's Alignment Maturity Model. The results of the questionnaire will be used in developing a proposed IT Governance Model for the case studied. Walter Sisulu University (WSU) has been identified as a case university; Stellenbosch University and Groningen University have been identified for the purpose of benchmarking.

What you will be required to do if you accept to participate:

Should you decide to participate in this study you will be required to:

- Sign the informed consent form.
- Complete the questionnaire. The questionnaire consists of different questions ranging from generic questions on availability and efficiency of ICT resources and services in the university and the level of IT effectiveness in the institution in

various management levels, staff including ICT staff, and students. It should take about 45 minutes to respond to all the questions. Because of the limited time frame for this study, the researcher will greatly appreciate if you could return the completed questionnaire within a period of two weeks.

- Attend an interview session with the researcher at your premises. The session will be concluded within 45 minutes.

- Where possible show the researcher some documents like reports, memos, meeting minutes, brochures that may help us further understand the subject matter of the study.

Potential Harm, Injuries, Discomforts or Inconvenience:

There is no known harm associated with participation in this study.

Potential Benefits:

The benefit of participating in this study is:

- You will make contribution towards establishing a model for improving IT Governance strategic alignment of the institutions of higher learning with the specific focus to the historical disadvantaged institutions.

Participation:

Your participation in this study is completely voluntary. Consequently, you may withdraw your consent or participation in this study without providing reasons for such a decision, and there will be no negative consequences.

Confidentiality:

Your anonymity together with that of your organisation will be maintained during data analysis and publication or presentation of the results, and no information that discloses your identity will be released or published. The following will be observed to ensure confidentiality.

- You will be assigned a number/code as names will not be recorded.

- The researcher will save the data file by your number/code, not by name.
- Only the researcher and the supervisors will view collected data in detail.
- All the data files will be stored in a secured location, accessed only by authorised researchers.
- Any identifying information from the documents provided will be expunged to guarantee anonymity.

Approval of the Study:

The Faculty Research and Higher Degrees Committee of University of Fort Hare has approved this study and its procedures.

If you have any questions about this study, you should feel free to contact them now or any time throughout the study. You may do so through the contacts of the study supervisors given at the beginning of this information leaflet.

INFORMED CONSENT

By signing this form I agree that:

- I understand the nature, conduct, benefits and risks of this study.
- All my questions were answered.
- I have the right not to participate and the right to withdraw at any time.
- I may refuse to participate or withdraw without consequences.
- I am free now, and in the future to ask any questions about the study.
- I have been informed that my personal information will be kept confidential.

I now in my own free will accept to participate in the study.

Participant's Name_____   Signature_____

Date _____

Researcher's Name_____ Signature_____

Date_____

Annexure A-6

UNIVERSITEIT · STELLENBOSCH · UNIVERSITY
jou kennisvennoot · your knowledge partner

19 October 2012

Ms Tembisa Grace Ngqondi
Faculty of Management and
Commerce
University of Fort Hare

Dear Ms Ngqondi

Re: A Model for Information Technology (IT) Governance to Improve IT Alignment of Multi-Campuses in South African Institutions of Higher Learning

Institutional permission is granted for interviewing Stellenbosch University staff for the purpose of this research project. Institutional permission is granted on the following conditions:

- The research must be carried out with the knowledge and authorization of Mr Helmi Dreijer, the Senior Director: Information Technology, Stellenbosch University
- staff participation is voluntary; they may choose to withdraw at any time
- the researcher must obtain the participants' informed consent
- the anonymity of participants must be protected
- the data that is recorded must be suitably protected
- the data collected may only be used for the purpose of this study
- the results of the research must be made available to participants.

Best wishes,

Jan Botha
Senior Director Institutional Research and Planning Division

Annexure A-7

university of groningen

office of the university

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9700 AB Groningen
The Netherlands

www.rug.nl

Ms. Tembisa Ngqondi
School of Computing
Walter Sisulu University
P.O. Box 19712
Tecoma
5214 East London
Rep. of South Africa

Handled by
Gonny Lakerveld

Date
13 March 2012

Our reference
WSU 237

Subject
Letter of invitation

Dear Ms. Ngqondi,

On behalf of the Dutch NPT project team, it is my pleasure to invite you for a research visit to the University of Groningen (RUG), the Netherlands, from 2 – 29 April 2012.
This visit will take place in the framework of the NPT/ZAF/237 project, *"Strengthening the Centre for Learning and Teaching and the SET Faculty of Walter Sisulu University"*. The project is part of the Nuffic NPT programme, a development cooperation programme of the Dutch Government.

The University of Groningen will book and pay hotel accommodation as well as insurance, living expenses and travel costs in the Netherlands.

For more information please contact Mrs. Gonny Lakerveld (e-mail: g.a.m.lakerveld@rug.nl).

Yours sincerely,

university of groningen

Mr. Renzo Tuinsma
Project coordinator
University of Groningen

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Annexure A-8

:WSU
Walter Sisulu University

DIVISION OF ACADEMIC AFFAIRS AND RESEARCH
DIRECTORATE OF RESEARCH DEVELOPMENT

Nelson Mandela Drive		*Buffalo City*
Mthatha Campus		*Potsdam Campus*
Private Bag X1		*EAST LONDON*
MTHATHA 5117		Tel: + 43 708 5444
Tel: + 27 47 502 2947/2647	Web Fax: 0866 541 093	Fax: + 43 708 5458
Fax: +27 47 502 2185	E-mail: ecishe@wsu.ac.za	
	bandlac@gmail.com	

11 December 2013

Ms. T. Ngqondi
University of Fort Hare
South Africa

Dear Ms Ngqondi,

Re: Request of Permission to Access your Institution for the Purpose of Data Collection

Permission is hereby granted provided findings of your research will be made available to the Directorate of Research Development, WSU, as well as the site in which the study will be conducted.

You are required to ensure that ethical issues are adhered to at all times.

Regards