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Dimensions of information technology governance: A study of theory and practice

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Dimensions of Information Technology Governance: A Study of Theory and Practice

By

Pui Shan Ko

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for the award of the Degree
of Doctor of Business Administration in Information Systems
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USE OF THESIS

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ABSTRACT

The emergence of corporate governance is the response to recent high profile collapses of organisations such as Enron and WorldCom. Because of the ubiquitous nature of Information Technology (IT) and its influence on organisational activities, IT governance is increasingly seen as an integral part of corporate governance. However, existing literature shows the lack of a common understanding of IT governance due to various perspectives held amongst academics and practitioners. For example, schools of thought group IT governance according to structure with an emphasis on control and co-ordination or process with an emphasis on capability and continuity.

The purpose of this research was to identify the key dimensions of IT governance from existing best practice frameworks and academic literature and to examine how they are reflected in the IT governance practices of organisations. Various legislations (e.g. Sarbanse-Oxley Act, 2002), best practice frameworks (e.g. Val IT, COBIT) and the writings of academic researchers (e.g. Van Grembergen, Weill & Ross) were reviewed which resulted in the synthesis of the following four key IT governance dimensions: Structures, People, Processes and IT Decision Domains, which were further divided into a set of sub-dimensions.

Among the domains of IT governance, risk management and value delivery are regarded as core and, as such, provided the focus for the empirical part of the research. Four major universities located in Perth, Western Australia, chosen as case studies, constituted two equal groups based on their relative emphasis of IT governance, viz. risk management or value delivery. The case study methodology was justified on the basis of the relative newness of the research domain and enabling "how", "what" and "why" questions to be explored. Semi-structured interviews with the IT Directors / CIOs of the four case organisations were conducted in which their IT governance (risk management/value delivery) practices were mapped against the identified theoretical dimensions. Data triangulation enhanced validity and reliability by using multiple data sources such as data from organisations' websites. Interviews were transcribed and computer-based qualitative data analysis software (NVivo) was used to build the case study database and to analyse data against the theoretical IT governance dimensions. First, a within case analysis provided "what" and "how" insights followed by cross case analysis in which "why" aspects are discussed.

This study found that IT governance is shaped by a number of sub dimensions, particularly organisational culture and leadership. They drive how IT governance is implemented and accepted within the participating organisations and influence whether or not an IT governance culture will be ingrained into the organisation. In addition, a strategy balancing formal, such as committee meetings, and informal communications, such as dialogues and networks, seemed to influence IT governance. It was notable that performance tracking was a weak and immature dimension and further attention is required from the participants to clarify what and how to measure the progress of IT governance. Finally, it was generally accepted that IT governance should be viewed from a holistic perspective to be able to oversee, coordinate and integrate all the constituents including processes, tools, structures and resources. The study findings enabled recommendations to be formulated to provide practical advice to other, similar organisations.

The thesis recognises a number of limitations which provide opportunities for further research. Among them are the nature of IT governance dimensions developed for this study and the research design which limits the potential for generalisation. By using this study as a reference point, future research can be expanded into different directions, such as examining IT governance in a wider context (e.g. different domains and sectors), establishing the influences of the characteristics of IT managers / CIOs (e.g. management traits) and developing progress towards IT governance maturity (i.e. a longitudinal study).

DECLARATION

I certify that this thesis does not, to the best of my knowledge and belief:

i. Incorporate without acknowledgement any material previously submitted for a degree or diploma in any institution of higher education;

ii. Contain any material previously published or written by another person except where due reference is made in the text; or

iii. Contain any defamatory material.

Signature   Date : 12 December 2008

PUBLICATION

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CHAPTER 1 - INTRODUCTION

1.1   Introduction

This thesis is the documentation for a Doctoral research program, undertaken at the Edith Cowan University in Western Australia. The objectives of the research work, presented here, were to synthesise a theoretical framework which draws upon a range of the best practice and research-based frameworks, and explores how the dimensions exhibited in the theoretical framework were reflected in practice.

The purpose of this chapter is to provide an overview of this study. It includes the background, the rationale, the research objectives, an overview of the research methodology and the significance of this study.

1.2   Background to the Research

Information Technology (IT) is such a ubiquitous part of our life that most organisations today agree that their businesses are hinged on the use of IT. Previous studies have shown that only 15% of the market value of today's enterprise lies in physical assets, while the remaining 85% resides in intangible assets - that is information (Information Technology Governance Institute [ITGI], 2002). While expenditures on IT investment have grown significantly over the last 20 years, Return On Investments (ROIs) do not seem to be aligned. Performance of IT is repeatedly criticised as lacklustre and does not live up to expectations (Symons, 2005). Some illustrative examples are:

- A 2002 Gartner publication found that on a worldwide basis, 20% of IT expenditures were waste, which stands for an annual destruction value of USD600 billion (as cited in ITGI, 2006b).

- A 2004 IBM survey of Fortune 1000 CIOs uncovered that 40% of all IT spending brought no return to their organisations (as cited in ITGI, 2006b).

While a range of factors may contribute to the underperformance of IT, most studies agree that the complexity[1] of IT does play a role (Irani & Love, 2002; Lin & Pervan, 2001). Due to this complexity, IT is not always on the board's agenda or governed with proper consideration with potentially catastrophic impacts.

The high-profile corporate collapses of Enron and WorldCom have placed senior management under scrutiny and elevated demands for legislation to improve compliance, particularly for large corporations and listed companies, to protect shareholders' interests. Broadly speaking, corporate governance exists to help improve the confidence of investors and stakeholders and to alert them early to any looming disasters. Senior management are made personally liable to the shareholders for the integrity and accuracy of financial results and their extensions including operating results, privacy and corporate reputation.

Since the influence of IT and its associated technology is so pervasive across all of an organisation's activities, a specific focus on IT governance is called for (ITGI, 2003). IT governance allows senior management to retain control and be responsible for IT operations and related IT decisions which must match with business goals and objectives. Corporate governance ensures that all key decisions (such as IT decisions) meet corporate vision, values and strategy. Therefore, IT governance can be considered as an integral part of corporate governance. Factors that significantly impact corporate governance will cascade to IT governance (Korac-Kakabadse & Kakabadse, 2001).

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[1] By complexity, it is meant by the involvedness of evaluating the costs (Bannister et al., 2001; Dempsey et al., 1998) and the benefits (ITGI, 2006b; Truax, 1997).

The purpose of IT governance is to improve planning, integration, communications and performance between business units and IT units. It complies with regulations and formalises IT oversight and accountability to ensure more effective management within the organisations. It makes organisations more successful by establishing coordinated mechanisms that link objectives to measurable goals. Table 1.1 summarises the qualitative and quantitative benefits that can be achieved through an effective IT governance regime (Jordan & Silcock, 2005). A full review of IT governance is provided in Chapter 2.

Table 1.1: Qualitative Benefits and Quantitative Benefits of IT Governance (adapted from Jordan & Silcock, 2005)

Qualitative benefits	- Tighter alignment of IT activities with desired business outcomes. - Better integration of IT communities across the organisation. - Better working relationship between the IT delivery units and the business units who benefit from IT when it works and feel the pain when it fails.
Quantitative benefits	- Better return on investments in IT. - Rational allocation of IT expenditure according to a balance of rewards sought and risks incurred.

1.3   Motivation to Conduct the Study

To implement IT governance effectively, understanding the concept is essential as it establishes boundary and the scope. Gorry & Morton (1989, p. 49) suggest that "a framework that allows an organisation to gain perspective on the field of information system can be a powerful means of providing focus and improving the effectiveness of system efforts." A common understanding in defining IT governance helps organisations focus on the important aspects of IT governance. As PricewaterhouseCoopers (2006b, p. 3) emphasised, "an accurate definition of IT governance is essential." The danger of not having a proper concept of IT governance is being unable to implement effective IT governance which subsequently does not deliver the maximum value to be derived from IT. According to a study conducted by Weill (2004) and his colleagues in

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the Centre for Information Systems Research (CISR), an improved awareness and understanding of IT governance would increase its effectiveness. Out of 256 Chief Information Officers (CIOs) surveyed, organisations with better than average IT governance gained at least 20% more benefits than organisations with weak governance. It is noted that although IT governance might not be the only factor increasing ROI, it definitely lays down rigorous and clear guiding principles for management to follow.

Despite much emphasis on understanding IT governance, there is a growing concern raised by researchers and academics in relation to the diverse and inconsistent concepts of IT governance found in the literature (Webb, 2006). Table 1.2 is a summary of the concerns in relation to the concept of IT governance:

Table 1.2: Summary of the Concerns of Academics and Practitioners on the Concept of IT Governance

Authors	Description
Weill & Broadbent (2002, p. 1)	• "The complexity and difficulty of explaining IT governance is one of the most serious barriers to increasing the value derived from IT."
Peterson (2004b, p. 41)	• "Although questions and concerns regarding IT Governance have been around since the introduction of IT in companies, currently there is no consistent, well-established body of knowledge and skills regarding IT Governance....IT Governance is a topic that has recently been rediscovered, and as yet, is ill-defined and consequently blurred at the edges."
Robinson (2005, p. 45)	• "Ask for a definition of IT governance and you will probably get a variety of answers."
ITGI (2006c, p. 21)	• "There is confusion on what exactly IT governance is. This problem is best to be addressed before elaborating on the different solutions for IT governance."
Pricewaterhouse (2006a, p. 5)	• "A holistic view that considers all dimensions of IT Governance is not widely found. The concept of IT Governance as an umbrella framework encompassing a wide spectrum of arrangements, including the measurement of benefits, has yet to emerge."

Authors	Description
Weill & Broadbent (2002, p. 1)	• "The complexity and difficulty of explaining IT governance is one of the most serious barriers to increasing the value derived from IT."
Pricewaterhouse Coopers (2006a, p. 13)	• "However, a thorough understanding of IT Governance is still lacking at an important portion of the organisations that need to implement effective IT Governance arrangements."
Webb (2006, p. 194)	• "Diverse definitions of IT governance....lack of clarity of the concept of IT governance."

In illustrating the various concepts of IT governance, the following are some of the common definitions found in the literature:

- "IT governance is the organizational capacity exercised by the board, executive management and IT management to control the formulation and implementation of IT strategy and in this way ensuring the fusion of business and IT." (van Grembergen, 2002, p. 240)

- "IT governance is the responsibility of the board of directors and executive management. It is an integral part of enterprise governance and consists of the leadership and organisational structures and processes that ensure that the organisation's IT sustains and extends the organisation's strategies and objectives." (ITGI, 2003, p. 10)

- "IT governance - Specifying the decision rights and accountability framework to encourage desirable behaviour in the use of IT." (Weill & Ross, 2004a, p. 8)

The difficulty of defining IT governance stems from the different points of view in the field. First, among the various perspectives is the structural view which regards IT governance as the establishment of the responsible functions and roles and responsibilities (Brown & Magill, 1994; Sambamurthy & Zmud, 1999). The second view is the process view which relates activities and mechanisms occurring within the organisation (Vitale, 2001). The third view is the performance view which measures whether IT

systems achieved the set goals using techniques such as a Balance Scorecard (van Grembergen, 2000). The fourth view is the technical perspectives within which some best practice frameworks are generally found. According to Keynes-Pearce (2002) and Vitale (2003), the various schools of thought can be grouped into a spectrum from structure-oriented, with emphasis on control or coordination, to process-oriented with emphasis on sustainable capability or continuous process. It is however noted that these categorisations of IT governance are not mutually exclusive.

Furthermore, Peterson (2004b, p. 41) suggested that the various concepts of IT governance are "partly attributed to the simultaneous enduring and evolving nature of IT governance, but partly also due to the specialisation and disconnectedness between globally-dispersed IT governance interest communities." While the evolving concept of IT governance is an inevitable issue, research efforts should seek to draw the diverse communities together towards a common understanding. The concept of IT governance described from one aspect or the other without taking into account the broad reach of the field would result in the true nature of IT governance being compromised and its effectiveness is affected (Webb, 2006).

1.4   Purpose of the Study

The purpose of this research is two-fold: (1) to develop the theoretical dimensions of IT governance; and (2) to validate the dimensions by taking it to organisations to examine how IT governance theory is reflected in practice. The aim is to bridge the gap between theory and practice by comparing the aspects that have been emphasised in literature against the way in which real life organisations have adopted them. The following delineates each objective in further detail:

- *To develop theoretical dimensions.* The primary purpose is to review, examine and analyse the current state of knowledge in respect to IT governance, with particular emphasis on the existing IT governance frameworks, models and methodologies. This review

included identification of prominent frameworks[2] and subsequently extracted key dimensions (or constructs) from them. The literature review was mainly drawn from two types of published sources: best-practice frameworks and research-based frameworks. This should provide a simple, yet comprehensive understanding of IT governance that could be used as a starting point for empirical verification.

- *To empirically validate and illustrate the application of the dimensions.* An empirical comparison between the dimensions developed from literature and case organisations which have already implemented IT governance was undertaken. The interest of this study lies in understanding how these dimensions are illustrated in practice relative to theory. Recommendations were proposed to organisations on ways to improve their IT governance.

1.5   Research Questions

From the above two research aims, the research focus of the study was cast through two research questions. The questions were designed to ensure that the study addressed the significant gaps in the literature in a manner useful to the practitioners involved. The two key research questions dealt with by this study are:

1.   **What IT governance dimensions can be extracted from current theoretical frameworks and best practice frameworks?**

2.   **How are these dimensions reflected in practice?**

1.6   Overview of Research Methodology

The description of research methodology provided in this section is a summary only. Details of the research methodology and design are provided in Chapter 3.

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[2] Though there are differences between the meanings of frameworks, models and methodologies, for the purpose of this study to research on the dimensions of IT governance, they are interchangeable.

The purpose of this study is to examine how IT governance is exhibited in practice and compare this against theory. Following an analysis of the research problems of the study, the field of knowledge and the theoretical lens held by the researcher, a case study methodology was the chosen method for this study.

Four case organisations which have a level of experience in IT governance participated in this study. They were divided into two groups based on the relative emphasis of IT governance within their organisations, that is risk management or value delivery. Data was collected mainly through semi-structured interviews with the IT Director or CIO of each organisation who represented the key person involved in IT governance. Interview questions were developed based on the developed theoretical framework. Case study protocol was used to ensure that questions asked were applied in a consistent manner throughout the four cases. All interviews were transcribed and information from case organisation websites was used as secondary source of data.

Data analysis techniques included content analysis, within case analysis and cross case analysis, with the aid of a qualitative research computer software package NVivo. To enhance the validity and reliability of the interpretation of data, data triangulation was part of the process which was done using multiple data sources such as secondary data from organisation websites and the academic literature to create a chain of evidence.

1.7 Theory versus Practice

While theory focuses on theoretical foundation, practice on the other hand focuses on the application and the practitioners. Neither exists independently. The linkage between both of them needs to be bridged especially as the focus of this study is IT governance, a topic highly relevant to real-life environments. The relationship between theory and practice is particularly crucial.

Relevance is important in Information Systems (IS) research. On one hand, it fulfills IS practitioners' needs in real-life, while on the other hand, academia provides education for the future IS professionals. As proposed by Klein et al. (2006) there are three dimensions in IS research relevancy: importance, accessibility and applicability. Importance refers to meeting the needs of practice by addressing a real-world problem in a timely manner. Accessibility refers to the need for research being conducted to be understandable, readable and outcome-oriented outside the academic world. Applicability refers to the published articles being complete and able to provide some guidance, directions and/or recommendations. The aspect of the importance of research is the most essential element to the needs of practice. As Rosemann & Vessey (2008, p. 2) suggested, "without research outcomes relevant to practice, the very existence of a research discipline could be questioned because the discipline could well lack impact beyond its own (academic) community".

The purpose of this study is to synthesise theoretical IT governance dimensions based on a broad range of best practice and research-based frameworks and then apply it to real life organisations for validation. In-depth research insights are gained and practical recommendations are proposed to improve organisations' IT governance generally and raise the understanding of IT governance. It has both theoretical and practice significance to the research community and practitioners. Details of the significance of the study are provided in the next section.

1.8   Significance of the Study

This study fills the void in empirical research by addressing the importance of having a clear definition of IT governance. The theoretical and practice significance of the study includes:

Theoretical Significance
- seeking to develop a unified understanding of IT governance which is lacking in the current literature;
- bridging the gap between theory and practice. It helps both academia and organisations to get a deeper understanding of what,

> how and why organisations use (or do not use) the dimensions of IT governance compared to the theoretical framework;
>
> - providing opportunities and a basis for further research such as framework development or refinement; and
>
> - conducting the research in the context of Australian organisations.

Practice Significance

- developing theoretical dimensions, which can be used by organisations, as the basis to develop their own frameworks which suit their organisational context, culture and strategies;

- raising executives' level of understanding of the concept of IT governance and the importance of understanding that concept properly; and

- providing practical recommendations to organisations generally on how to implement IT governance.

1.9   Intended Audience

The intended audience of this study includes academia (such as academics in the IS/IT discipline) and practitioners (such as CEOs, CIOs, and IT governance specialists). Other practitioners such as risk management specialists, internal auditors and business executives may also benefit. The framework gives the intended audience a central focus on aspects they need to emphasise in seeking to optimise their practices.

1.10   Structure of the Thesis

This thesis is organised into the following five chapters:

Chapter 1: Introduction

This chapter provides an overview of the research including the background to the research, the motivation for conducting the study, research objectives, an overview of research methodology adopted and the significance of the study.

Chapter 2: Literature Review

This chapter provides an in-depth account of the review of literature relevant to IT governance including a detailed analysis of both its background and its diverse definitions. A theoretical framework based on the literature review of best practice and research-based frameworks was synthesised. This forms the basis of the research for the empirical study.

Chapter 3: Research Methodology

This chapter describes the research methodology and design employed in the study. This includes a review of the various philosophical perspectives and the justification for choosing case study research as the preferred methodology. Case sampling design and definition, tools, and the instruments used for collecting and analysing the data are outlined.

Chapter 4: Findings

This chapter presents the results of interviews with the IT Directors / CIOs of four chosen case organisations. Each organisation is analysed as an individual case. Background information, initiation of IT governance and the use of IT governance (under the headings of Structures, People, Processes and IT Decision Domains, as described in the theoretical framework) are examined. A summary comparing the similarities and differences across the cases is presented.

Chapter 5: Discussion and Conclusion

This chapter discusses the research findings and their mappings against the theoretical framework. Limitations of the study and the implications for future research that arose from this study are described. Practical recommendations to improve organisations' IT governance and research contributions to both the research community and practitioners are provided.

CHAPTER 2 - LITERATURE REVIEW

2.1   Introduction

The literature review for this study was conducted over a period of 18 months during 2006-2008. The objective of the review was to acquire an understanding of the current state of knowledge in the field of IT governance and to develop a theoretical framework which was used as the basis for this study. The major elements in the review process included the historical aspects, general theory and an overview of various IT governance frameworks drawing on a numerous texts, refereed journal publications, conference proceedings, internet-sourced publications and trade journals.

2.2   Development of IT Governance

2.2.1   Origin of Governance

Since one of the purposes of this study is to understand the concept of IT governance, it is important to trace the origin of the word "governance". The noun "governance" is a derivative of the verb "to govern". According to the Ask Oxford (n.d.), govern comes from the Greek word "kubernan"; it means "to steer". It is to guide or control the movement of (for example, a vehicle or a ship) or to direct / guide in a particular direction. "Govern" has several meanings:

- to conduct the policy and affairs of (a state, organisation, or people);
- to control or influence;
- to constitute a rule, standard, or principle for (Ask Oxford, n.d.).

Governance denotes the "action or manner of governing" (Ask Oxford, n.d.). While action is the process of doing something in order to achieve a purpose, manner is the way in which something is done or happened. From this preliminary diagnosis, it can be concluded that governance

includes two fundamental elements: processes (i.e. action of governing) and structures (i.e. way the organisation is designed). In addition, the implication of such a perspective is a people element (i.e. those required to perform or carry out the actions).

The term IT governance started to appear in academic papers from the mid to late 1990s (Webb, 2006). Its emergence as an important area of study is a response to the poor performance of IT and the expectation that IT should deliver value to organisations. There are two obvious influences on which IT governance is premised: corporate governance and IT strategy. Figure 2.1 illustrates the relationship between corporate governance, IT governance and IT strategy as discussed below.

```
┌─────────────┐         ┌─────────────┐
│  Corporate  │   ──▷   │  Corporate  │
│ Governance  │         │  Strategy   │
└─────────────┘         └─────────────┘
      △                       △
      │                       │
┌─────────────┐         ┌─────────────┐
│IT Governance│   ──▷   │ IT Strategy │
└─────────────┘         └─────────────┘
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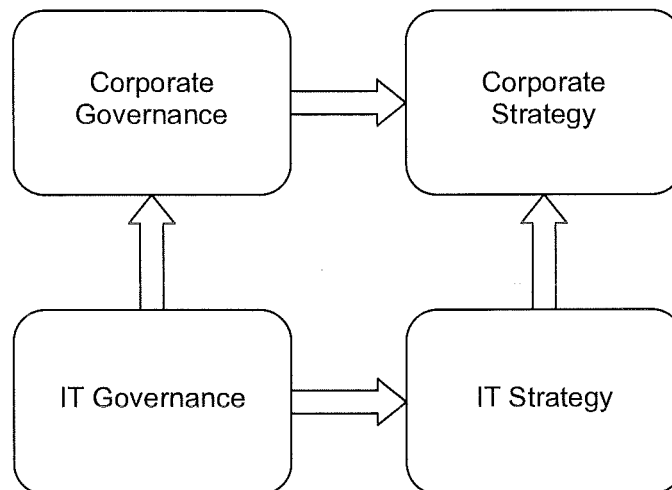
Figure 2.1: Relationship between Strategy and Governance

2.2.2 *Corporate Governance and Corporate Strategy*

The concept of corporate governance dates back to 1999 when the Organisation for Economic Co-operation and Development (OECD, 1999) sought to promote its importance. The Principles of Corporate Governance argued that the aim of corporate governance is to provide guidance to "help improve the confidence of domestic investors, [which] may reduce the cost of capital, and ultimately induce more stable sources of financing". The corporate governance approach proposed by the OECD sought to provide

insights and guidance at a macro level through the following set of principles:

- the basis for an effective corporate governance framework;
- the rights of shareholders and key ownership functions;
- the equitable treatment of shareholders;
- the role of stakeholders;
- disclosure and transparency;
- the responsibilities of the board.

Corporate governance has the objective of ensuring that key decisions are in line with the corporate vision, value and strategy[3]. With the collapse of Enron and the problems within Arthur Andersen and WorldCom, the duties and responsibilities of boards of directors for public and privately held corporations were subject to scrutiny. As a response and in order to prevent similar problems from happening again, the US Sarbanes-Oxley Act was written to stress the importance of business control and auditing. Corporate governance is the responsibility of the Board and senior management in order to pursue objectives that are in the interests of the organisations and stakeholders.

2.2.3   IT Strategy

Luftman (1996, p. 408) described strategies as "the way in which the business allocates resources and takes action to achieve the vision and mission. They are a pattern of policies and plans of action that develop competitive advantage over a given period." The aim of strategic planning is to set the direction for an organisation so that potential threats are overcome and opportunities are maximised. IT strategy specifically concentrates on strategic IT issues by exploring how IT works for business, exploiting its full potentials and improving overall organisational performance. Organisations need to incorporate IT into the strategies to attain their objectives and maximise business values.

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[3] As discussed in a later section, IT governance is generally regarded as an important subset of corporate governance (ITGI, 2003; Korac-Kakabadse & Kakabadse, 2001; Webb, 2006)

2.2.4   IT Governance

The ITGI Global Survey Report (2006c) showed that 87% of its respondents expressed the view that IT was "quite to very important" to the delivery of their strategy or vision. While many organisations have invested heavily in IT to improve their company performance, expenditures on IT have become uncontrollable and returns disappointing.

The benefits of IT can be described as "complex, context-specific and dynamic...[they are] in the eye of the beholder" (ITGI, 2006b). For example, there are many facets of IT benefits that organisations need to interpret; these include: financial or non-financial benefits; direct or indirect benefits; tangible or intangible benefits; efficiency or effectiveness benefits; sustainability or environmental benefits; operational, tactical, strategic or organisational benefits. Thus, organisations have to realise the benefits in the context of an organisation's values, culture and will vary from investment to investment (Fink, 2003).

IT governance aims to ensure that IT-related decisions are linked with the organisation-wide objectives and seeks to establish coordinated mechanisms to support it. It formalises IT oversight and accountability and ensures compliance with regulations. ITGI (2002) proposed five domains which organisations can achieve via IT governance:

Strategic alignment. This ensures that only IT projects aligned with strategic business objectives are approved, funded and prioritised. Alignment should maintain the balance between investments that grow the existing businesses and those with the potential to transform the business in long-term.

Value delivery. This concentrates on optimising costs and proving the values of IT which include increasing revenues and market share, and improving customer satisfaction. Value must be created in the context of the organisation's mission and business needs. This require IT strategies to be aligned with the business goals continuously.

Risk management. This addresses the safeguarding of IT assets, including project investments, and covers diaster recovery and continuity of operations. Risks are mitigated to ensure that organisations adapt to the competitive business environment.

Resources management. This aims to optimise human capital resources and to ensure the appropriate IT capabilities for business needs are identified and deployed. Maintenance of human resources requires their availability, competency, training and retention.

Performance management. This tracks project delivery and monitors IT services. It requires comprehensive measurement and monitoring of performance during strategy implementation, project completion, resource usage, process performance, and service delivery.

Of the five domains, value delivery and risk management are the two fundamental concerns of IT governance as suggested by ITGI (2003).

2.2.5 *IT Governance vs. Corporate Governance vs. IT Strategy*

When comparing IT governance with corporate governance, it is clear that corporate governance provides overall strategic direction for the organisation and establishes overall policies and procedures and control accountabilities. On the other hand, IT governance has a specific technological IT focus. It ensures the strategic alignment and the delivery of business values through the use of IT. Particularly, it ensures that IT resources are used responsibly and IT risks are managed effectively.

When comparing IT governance with IT strategy, the latter deals with strategy by focusing on responsibilities shared between IT units and business units. IT governance addresses similar concerns, it highlights controlling, leadership, and responsibilities at the highest level (board of directors) of accountability. Based on the comparison carried out by Webb (2006), Figure 2.2 summarises differences between corporate governance, IT governance, IT strategy and corporate strategy.

Corporate Governance

- Strategic direction.
- Performance management.
- Risk management.
- Overall policies and procedures.
- Control and accountability.

Corporate Strategy

- Align business goals and objectives with organisational visions.
- Exploit competitive advantage.
- Guide the management of resources efficiently and effectively.
- Develop overall policies and architectures.

IT Governance

- Strategic alignment.
- Deliver business value through IT; exploit opportunities and maximise benefits.
- Performance management; Use IT resources responsibly.
- Risk management; Manage IT related risks appropriately.

IT Strategy

- Align IT with business goals.
- Exploit IT for competitive advantage.
- Guide the management of IT resources efficiently and effectively.
- Develop IT policies and architectures.

Figure 2.2: Differentiation between Strategy and Governance (adapted from Webb, 2006)

2.2.6   IT Governance vs. IT Management

Differences between governance and management have been distinguished in the literature in terms of their scope and focus (Peterson, 2003). As Peterson suggested, IT management focuses on the current and internal aspects of the organisation (that is the IT effectiveness and efficiency), while IT governance focuses on the dual demands of future and external requirements (that is the daily business operations and the positioning of IT functions to meet future business needs).

Furthermore, IT management activities stress the division between IT units and business units. But governance, while focusing on the same domain, aims at producing policy and conducting affairs, controlling and influencing, and developing standards and principles. It requires the highest level of direction, leadership and control. IT governance has evolved to include an

external, future, top-down and strategic approach while management has an internal, current approach which incorporate all levels and both strategic and operational aspects. Figure 2.3 illustrates how IT management and IT governance relate to each other in terms of business and time orientations.
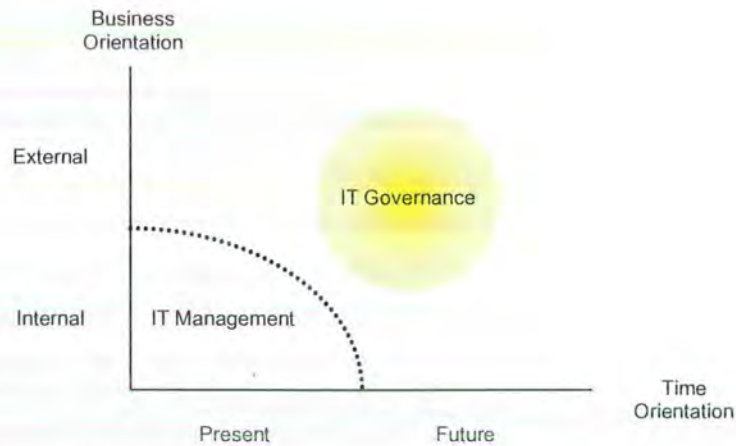
Figure 2.3: IT Governance and IT Management
(adapted from Peterson, 2003)

2.3   Review of Legislation related to IT Governance

An important reason why organisations implement IT governance is to comply with external, regulatory requirements. A number of legislation and standards that may have significant impact on the IT governance regulation in the Australian context are considered in this study.

2.3.1   *Sarbanes-Oxley Act (2002)*

The US Sarbanes-Oxley Act (SOX) covers corporate governance for public companies listed on the US Stock Exchange (even though they operate in Australia) and emphasises strong control over financial reporting. It is a federal law enacted in 2002 in response to a number of major corporate and accounting scandals. It is relevant to Australia context as they are the first set of regulations written that other countries used that as the basis to develop their own regulations. SOX has been a catalyst for the development of IT governance as it establishes a benchmark and became an important driver for organisations to implement IT governance. There are three sections particularly relevant to IT governance:

Section 302: Officers are required to certify the financial reports quarterly and to disclose all known control deficiencies and acts of fraud. This verifies the completeness and accuracy of financial statements. The relevance to IT governance is its focus on security such as data integrity, data confidentiality, authentication and authorisation.

Section 404: Officers are required to certify internal controls annually and review changes quarterly while an independent auditor must confirm and vertify financial reports. The relevance to IT governance is its focus on control over IT such as operational processes and change management.

Section 409: Officers are required to monitor operational risks and report material changes in real time. The relevance to IT governance is its focus on IT security, IT control, IT risks and information security. The Act implicitly mandates transparency, clear accountability and rigorous internal controls. It places stress on the importance of corporate governance and IT governance as vital oversight tools for organisations.

2.3.2   *Standards Australia*

Standards Australia International (SAI) was the first national body to publish standards for corporate governance. The AS8000 series of corporate governance standards comprise the following:

- Good Governance Principles (AS8000);
- Fraud and Corruption Control (AS8001);
- Organisational Codes of Conduct (AS8002);
- Corporate Social Responsibility (AS8003);
- Whistle Blower Protection Programs (AS8004);
- Risk Management (AS4360);
- Corporate Governance of ICT[4] (AS8015).

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[4] ICT stands for Information Communication and Technology. For the purpose of this study, the terms ICT and IT are interchangeable.

AS8015-2005 (Corporate Governance of Information Communication and Technology) was published in January 2005. It was the first governance guide for technology in the private and public sectors and provides both principles and a model by which organisation can govern their ICT effectively. Standards Australia (2005) defines IT governance as "the system by which the current and future use of ICT is directed and controlled. It involves evaluating and directing the plans for the use of ICT to support the organization and monitoring this use to achieve plans. It includes the strategy and policies for using ICT within an organisation". The framework helps ensure that ICT is aligned with business objectives and delivers benefits to those interested in, or accountable for, the performance of ICT within an organisation, be they users, employees, customers, suppliers, shareholders or board directors. The six key principles are:

- Establish clearly understood responsibilities for ICT;
- Plan ICT to support the needs of the organisation;
- Acquire ICT validly;
- Ensure ICT performs well whenever required;
- Ensure ICT conforms to external regulations and internal policies;
- Ensure that ICT use respects human factors.

2.3.3   Australian Stock Exchange

The Australian Stock Exchange (ASX) developed a set of guidelines titled "Principles of Good Corporate Governance and Best Practice Recommendations" in March 2003 to protect stakeholders and shareholders of companies listed in Australia. The Principles (ASX, 2003, p. 3) define corporate governance as "the system by which companies are directed and managed. It influences how the objectives of the company are set and achieved, how risk is monitored and assessed, and how performance is optimised". The relevance of this set of principles to IT governance is the need to protect stakeholders and shareholders from a risk management perspective and to ensure that resources are used responsibly.

From the above discussion, it can be concluded that the objective of IT governance is to involve senior management by outlining their responsibilities in decision-making and that organisations have transparent administrations.

2.4 Review Methodology of IT Governance Framework Literature

The literature review of IT governance frameworks is based on two major sources: best practice frameworks and research-based frameworks. For best practice frameworks, the electronic database ProQuest (ABI/INFORM Global™) and leading websites in relation to the frameworks were assessed, namely Information Systems Audit and Control Association (ISACA, www.isaca.org), IT Governance Institute (ITGI, www.itgi.org). For research-based frameworks, the primary sources of this review were academic journal articles, books and conference proceedings.

ProQuest (ABI/INFORM Global™) is an online business information database which houses a large collection of international journals and trade publications. It includes the top five ranked Management of Information Systems (MIS) journals (Levy & Ellis, 2006):

- MIS Quarterly;
- Information Systems Research;
- Communications of the ACM;
- Management Science;
- Journal of MIS.

Selected practitioner journals (such as Sloan Management Review and Harvard Business Review) and conference proceedings (i.e. Proceedings of the Hawaii International Conference on System Sciences) were also considered for this study.

Between February and August 2007, over 150 articles were found during

the initial review search. They were identified by key terms such as IT governance, IT governance framework, IT governance model, IT governance standard, IT governance definition and corporate governance. The selection criteria of articles for the final review were based on their relevance to the topic and the number of times they were cited by other authors. MetaLib® MetaQuest including Elsevier (ScienceDirect) and the Google Scholar search engine were used to track writings by researchers prominent in the field.

2.5   Review of Best Practice Frameworks

Best practice, as defined by IT Service Management Forum (n.d.) is "an industry accepted way of doing something, that works". They are standards-origin frameworks that were developed and sponsored by highly regarded organisations, like ISACA and ITGI. Best practice frameworks are included in this study as of their relevancy to the practice.

ITGI (2003, p. 10) defines IT governance as "the responsibility of the Board of Directors and executive management. It is an integral part of enterprise governance and consists of the leadership and organisational structures and processes that ensure that the organisation's IT sustains and extends the organisation's strategy and objectives." The purposes of the best practice frameworks are to provide guidelines and share experience from organisations that have implemented IT governance rather than "reinventing the wheel". They provide a common language and a standardised approach to facilitate communication and allow organisations to measure, monitor, and evaluate their situation compared with predefined factors, criteria or benchmarks. Amongst the best practice frameworks, three most widely adopted ones are (Spafford, 2003):

- COBIT (Control Objectives for Information and Related Technology);
- ITIL® (Information Technology Infrastructure Library);
- ISO17799: 2000 (International Standard Organisation).

More recently, ITGI developed Val IT, a framework which views IT from a business and strategic perspective. The following is a description of each of the four best practice frameworks.

2.5.1 *Val IT*

Val IT, developed by ITGI in 2006, is a framework to assist organisations to look at IT from a business and financial strategic point-of-view. Figure 2.4 illustrates the "Four Ares" that organisations need to consider in their IT-enabled investments. According to ITGI (2006b), IT should be a means to an end. Val IT focuses on the end and seeks to ensure that values are realised from IT investments (are we getting the benefits?), investment decisions are optimised and a balanced portfolio of IT-enabled business investment is maintained (are we doing the right things?). On the other hand, COBIT focuses on the means and the execution (are we doing them the right way and are we getting them done well?) which is discussed in the next section.

The three main processes involved in Val IT are: Value Governance, Portfolio Management and Investment Management (ITGI, 2006b). Value delivery is driven by strategic alignment, which is another domain of IT governance. Val IT helps organisations respond to the organisational needs, creates visions or goals and achieves them in long term. Through selecting investment sensibly and managing it properly, Val IT supports the strategic alignment between IT and business.
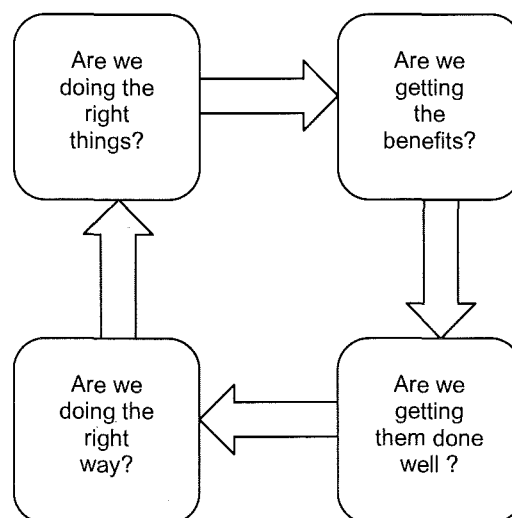
**Figure 2.4: Val IT Framework: Four Ares
(adapted from ITGI, 2006b)**

2.5.2   COBIT

COBIT was originally developed by ISACA in 1996. The concept underpinning COBIT is that control of IT should start with examining information needed to support business objectives or requirements. By focusing on information produced by applying IT-related resources, IT processes are managed effectively and securely. It is a high level governance and control framework, viewing IT from a control and process perspective. In doing so, COBIT aims to ensure IT is aligned with the business, to maximise benefit, to use IT resources responsibly and ensure IT risks are managed and mitigated. Figure 2.5 is an illustration of the COBIT framework. It is comprised of 34 high-level control objectives, grouped into four main domains (ITGI, 2007):

- Planning and organising;
- Acquisition and implementation;
- Delivery and support;
- Monitoring.

Corresponding to the 34 control objectives are 318 detailed control objectives. The core of COBIT to IT governance is to assist business to maintain effective control over IT. It focuses heavily on how organisations should achieve benefits through clear and detailed processes.
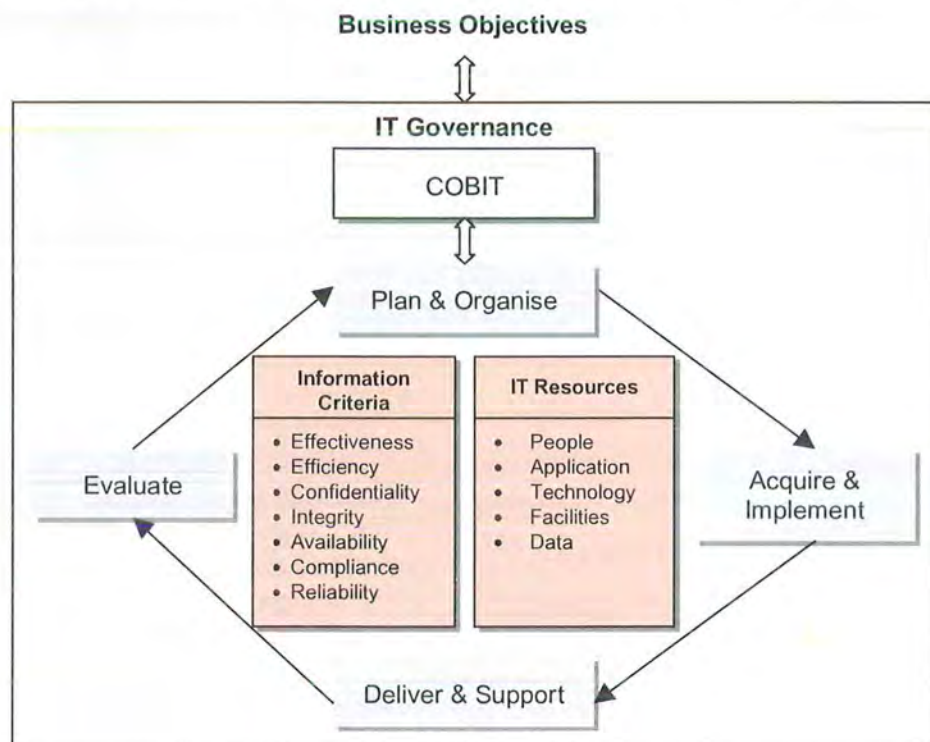
Figure 2.5: COBIT Framework – Version 4.1 (adapted from ITGI, 2007)

2.5.3   ITIL®

Information Technology Infrastructure Library (ITIL®) is a service management framework developed by the UK's Office of Government Commerce in the 1980's with the aim of better use of IT resources and services (ITIL, n.d.).   It was originally very much a process-oriented framework but has evolved into a more lifecycle-centric approach in its recent release (version 3).   Whilst COBIT articulates "what" needs to be done, ITIL® focuses on "how" to do it and "who" should perform each task. It aims to have IT processes in place to better coordinate people, software and hardware.   Figure 2.6 is an illustration of ITIL® framework which divides IT processes into the following ten areas and the relationship that each of the processes has with the business and technology (Watt, 2005):
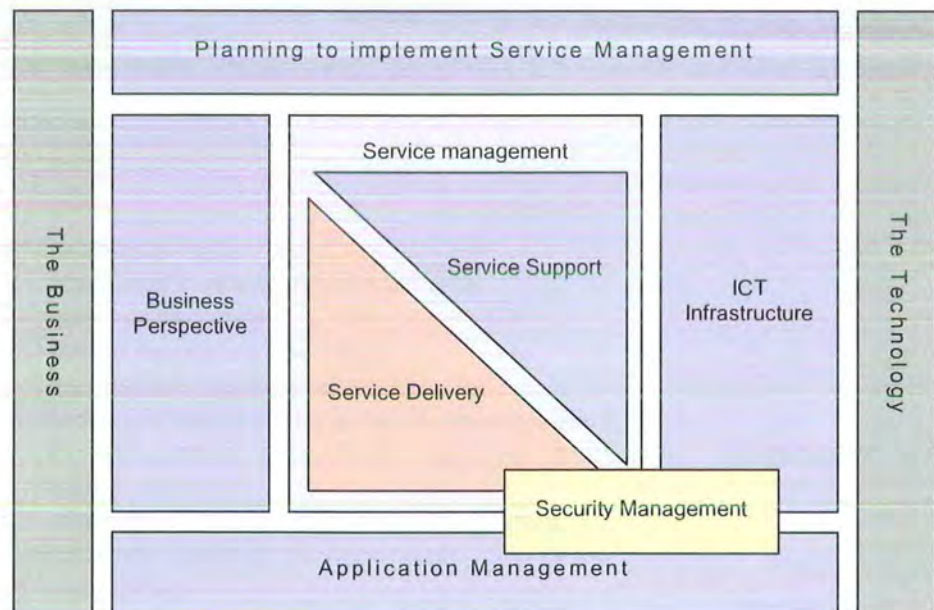
Figure 2.6: ITIL® Framework - Version 2

- Service-level management;
- Capacity management;
- Contingency planning;
- Availability management;
- Cost management for IT services;
- Configuration management;
- Problem management;
- Change management;
- Help desk;
- Software control and distribution.

Since ITIL® has a strong service perspective, it supports IT governance by assisting organisations deliver values to internal and external customers from a service perspective. This includes system development and operations (e.g. service-desk management and security management) to achieve customer satisfaction and quality information.

2.5.4   *ISO17799:2000*

ISO17799:2000, a security management framework, focuses on the security of information which includes privacy issues (both at the physical and non-physical levels). It was originally published by the International Organisation for Standardisation (ISO) and was derived from the UK government's BS17799. Figure 2.7 is an illustration of the framework (Saint-Germain, 2005), which comprises ten security domains addressing security compliance at managerial, organisational, legal, operational and technical levels:

- Security policy;
- Organisation of information security;
- Asset management;
- Human resources security;
- Physical and environmental security;
- Communications and operations management;
- Access control information systems acquisition, development and maintenance;
- Information security incident management;
- Business continuity management;
- Compliance.

ISO17799:2000 supports IT governance from a risk management perspective, emphasising the reduction and mitigation of the risks to which organisations are exposed. It ensures that business operations keep running should a systems outage or other interruption occur. It also delivers value to customers by giving them confidence in using IT, and assures the confidentiality and integrity of information by preventing unauthorised access to business facilities (ITGI, 2006a).

Organisational

Security Policy

Organisational
Security

Asset Classification
and Control

Access Control

Compliance

Personnel Security

Physical
Environmental

System Development
and Maintenance

Communications
and Operations

Business Continuity
Management

Operational

Legend

Organizational
Aspect

Technical Aspect

Physical Aspect

Figure 2.7: ISO17799 (adapted from Saint-Germain, 2005)

2.5.5   *Summary of Best Practice Frameworks*

While each framework has a specific focus, they also complement each other. Val IT takes a business strategic perspective of IT and ensures that values are delivered from IT through strategic alignment of IT to business. COBIT takes an audit and control perspective and oversees the IT processes, thus it minimises and mitigates IT risks. ITIL® takes a service management perspective with the aim of delivering values to internal and external customers. ISO17799 focuses on security issues and implements controls to mitigate the risks that are identified. Table 2.1 summarises their respective characteristics.

Table 2.1: Summary of the Characteristics of Val IT, COBIT, ITIL® and ISO17799

Best practice frameworks	Characteristics
Val IT Business and financial strategic framework	• Strategic framework viewing IT from business and financial perspective; • "End" oriented; • Investment decision (are we doing the right thing?) and realisation of benefits (are we getting the benefits); • Value delivery and strategic alignment focus.
COBIT Highest-level control framework	• Control framework; • Top-down level (highest level); • Process oriented (what needs to be done? Are we doing the right way? Are we getting them done well?); • Risk management focus.
ITIL® Service management framework	• Service management framework; • Process oriented (what needs to be done in service management); • Technical (IT) perspective; • Value delivery focus.
ISO17799 Security framework	• Security management framework; • Process oriented (what needs to be done in security management); • Technical (IT) perspective; • Risk management focus.

2.6 Review of Research Based Frameworks

The following is a list of researchers that were identified during the literature review process discussed earlier and who have contributed significantly to the development of IT governance.

2.6.1 Brown and Magill (1994)

According to Brown & Magill (1994, p. 371), IT governance essentially is "the locus of responsibility" for IT functions. This concept contributes to the fundamental research of IT governance. In their study, IT governance was viewed from a structure perspective where the concern is about governance design. Four configurations were identified and justified:

• a highly centralised; or

• a highly decentralised IS structure; and a pattern of antecedents (drivers or enablers) that explain an organisation's choice to be;

• decentralised;

• recentralised.

The study is valuable in its examination of patterns of internal (for example, oganisational structure and size) and external antecedents (for example, industry stability and computer literacy of workforce) that impact on the choice of the IT governance structures

2.6.2 Henderson, Venkatraman and Oldach (1996)

According to Henderson et al. (1996, p. 27), governance specifies "the allocation of decision rights to the key executives or partners" in respect of IT activities. The focus should be on clearly delineated decision rights, and the roles and responsibilities utilised to implement strategy, in order to create the locus of control for IT activities. Locus of control concerns centralisation and decentralisation of IT decisions and the levels of competency of people involved in it. As they suggested, decision-making is not about daily operational decision, instead it is about the distribution of decision rights.

IT governance is viewed from a strategic alignment perspective. It is part of the strategic alignment mechanisms which are used to link with IT strategy, i.e. IT strategies are driven by the decisions made in IT governance. Therefore, IT governance is employed to achieve strategic alignment within the organisations thereby achieving strategic control and internal consistency.

2.6.3 Sambamurthy and Zmud (1999)

They define IT governance as the "patterns of authority for key IT activities" (1999, p. 261). The IT governance arrangements represent an organisation's IT-related authority patterns. The use of IT governance is to direct, control and coordinate three spheres of IT activities: IT infrastructure management, IT use management and project management. This is done by three sets of stakeholders who provide different degrees of decision authority in designing IT governance arrangement: corporate IS, divisional IS, and line management. As a result, three modes of IT governance arrangement can be identified:

- **Centralised governance:** corporate IS has the authority for all three of the spheres of IT activities.

- **Decentralised governance:** divisional IS and line management assume authority for all IT activities but inside them, there are variations in decentralised IT governance.

- **Federal governance:** both corporate IS and the business unit (either the divisional IS or line management) assume authority for specific spheres of IT activities.

2.6.4   *Vitale (2001)*

Vitale (2001) describes IT governance as the process of making decisions about IT and monitoring IT performance. According to the author, it is about sharing IT decision rights across the organisation and then monitoring IT performance; IT governance is a process more than an outcome. It concerns the patterns of decision-making rather than a structure or a list of decisions that need to be made. In this context, it is designed to handle four types of decision, which are delineated in Figure 2.8. Furthermore, it is a continuous process that should lead to transparent IT decision making, clear accountabilities, acceptable and actionable IT measurements. The approach focuses on the following aspects:

- Who is IT accountable to whom within the business?
- How are we monitoring ourselves?
- What is the strategy needed for IT to support the business?
- What are the internal policies that are necessary for IT to be successful in the future?
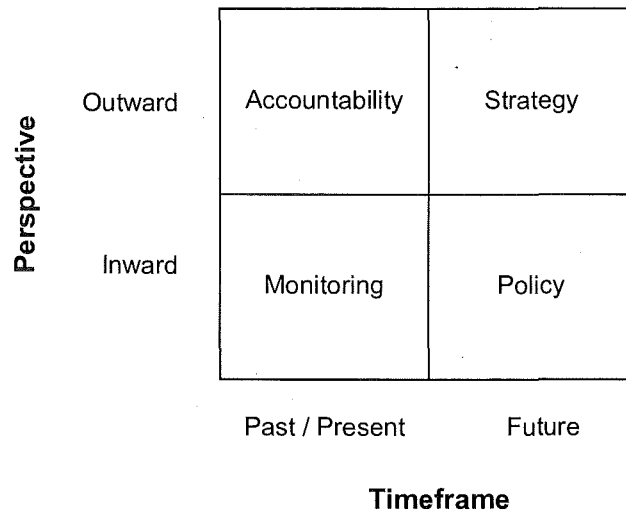
Figure 2.8: Four Types of Decision
(adapted from Vitale, 2001)

2.6.5   *Van Grembergen (2002)*

Van Grembergen (2002, p. 1) defines IT governance as the "organizational capacity exercised by the board, executive management and IT management to control the formulation and implementation of IT strategy and in this way ensuring the fusion of business and IT".

Van Grembergen and de Haes (2005) developed a framework, which closely connects three essential elements: IT governance structures, processes and relational mechanisms, to help design and implement IT governance (as shown in Figure 2.9). Structures "involve the existence of responsible functions such as IT executives and a diversity of IT committees" while processes refer to "strategic decision-making and monitoring" and "the relational mechanisms include business/IT participation, strategic dialogue, shared learning and proper communication" (p. 1). This framework supports IT governance by identifying core elements and the mechanisms to achieve their integration and coordination.
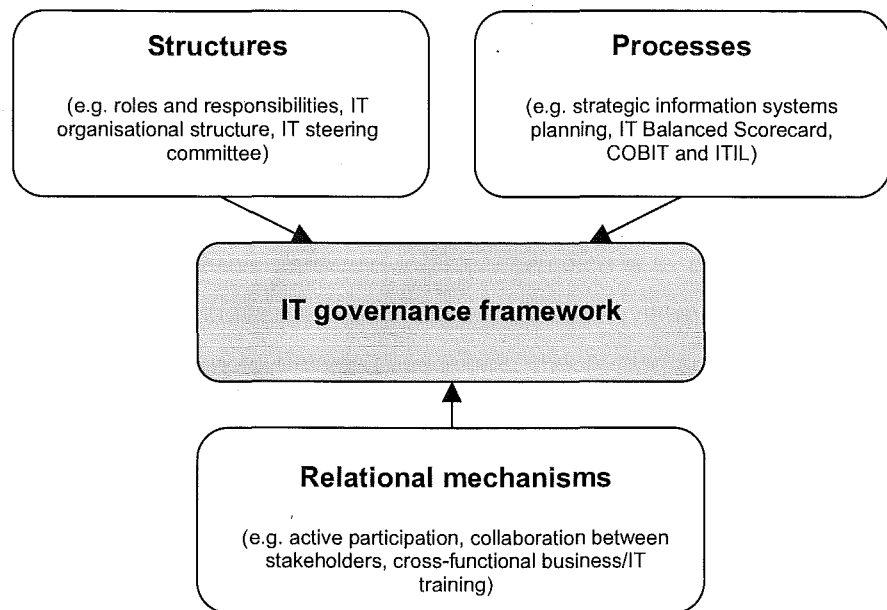
**Figure 2.9: Main Elements of an IT Governance Framework
(adapted from van Grembergen & de Haes, 2005)**

2.6.6 Schwarz and Hirschheim (2003)

Schwarz & Hirschheim (2003, p. 131) define IT governance as the "IT related structures and architectures (and associated authority pattern) implemented to successfully accomplish (IT imperative) activities in response to an enterprise's environmental and strategic imperative." According to the authors, there are three essential elements in the governance:

- **Strategic and environmental imperatives** that define a necessary response from IT;
- **Structures** designed to support the response;
- **An imperative for IT** to be successful in this design.

In relation to structures, the authors re-conceptualised the "organising logic for IT activities" (also called a platform logic for organising IT activities) (Schwarz & Hirschheim, 2003, p. 131), as comprising three elements: IT capabilities, relationship architectures and integration architectures. First,

IT capabilities link to the strategic and environmental imperatives that instigate IT to define capabilities that the organisation requires. Second, from the platform logic perspective, IT organisational architectures are divided into relational architecture and integration architecture to assist in understanding how IT relates to business units and how to coordinate IT with business capability.

The relevancy of this definition to IT governance is to explore the concept beyond the centralisation and decentralisation viewpoints. The focus should be on how to deliver capabilities, mechanisms, and how they are linked to capabilities in order to explore any new opportunities for the IT function. This structural perspective of IT governance looks at the processes and systems that connect and activate structural frameworks and create relationships with business units.

2.6.7   *Peterson (2004)*

Peterson (2004a, p. 8) defines IT governance as "the distribution of IT decision-making rights and responsibilities among different stakeholders, and the procedures and mechanisms for making and monitoring strategic decisions regarding IT". In today's turbulent business environment, one of the key challenges for organisations is to have certain "degrees of flexibility" (Peterson, 2004a, p. 7). As he recognises, the formal allocation of IT decision-making authority does not resolve the need for effective coordination. Peterson proposes IT governance should address the allocation of formal IT decision-making authority and the coordination of IT decision-making expertise and influence (informal authority).

The underlying perspective of IT governance, according to Peterson (2004a), is to design a transparent, efficient, and flexible mode for IT governance and highlight the need for organisations to build and integrate IT capabilities. What is important is "the (cross-functional) managerial ability to direct and coordinate the multifaceted activities associated with the planning, organisation, and control of IT" (p. 14). As he explained, the vertical integration provides standardisation for coordination but lacks the

ability of governing IT effectively; thus he proposes a horizontal integration capability which covers:

- **Structure capability:** structural (formal) devices and mechanisms to connect and enable horizontal liaison, contacts between business and IT management (decision-making) functions.
- **Process capability:** formalisation and institutionalisation of strategic IT decision-making or IT monitoring procedures.
- **Relational capability:** active participation of and collaborative relationships among corporate executives, IT management and business management.

2.6.8 *Weill & Ross (2004)*

According to Weill and Ross (2004a, p. 8), IT governance involves "specifying the framework for decision rights and accountabilities to encourage desirable behaviour in the use of IT". Based on research that covered 250 organisations in 23 countries, Weill and Ross (2004a) presented a framework to evaluate an organisation's IT governance which comprised three critical components:

- What decisions need to be made?
- Who makes them?
- How they are enacted?

According to the authors, IT decisions in IT governance should be by "nature" which can be identified as IT principles, IT architecture, IT infrastructure strategy, business applications, and IT investment and prioritisation. The "who makes them" component refers to "who" is responsible for making key decision and "who" provides inputs to IT decisions and their roles. The "how they are enacted" component involves setting up mechanisms such as IT steering committees, business units, IT councils and IT architecture forums. Based on these components, Weill & Ross (2004b) presented a governance arrangement matrix mapping six organisational structures (or "archetypes") against five key IT decision domains (see Figure 2.10).

Governance Archetype	Decision Domain									
	IT Principles		IT Architecture		IT Infrastructure Strategies		Business Application Needs		IT Investment	
	I*	D**	I	D	I	D	I	D	I	D
Business monarchy										
IT Monarchy										
Feudal										
Federal										
Duopoly										
Anarchy										

* I - Input
** D – Decision

Figure 2.10: Governance Arrangement Matrix

The business monarchy and IT monarchy archetypes are centralised decision making structures for which decision-making lies strictly with the C-level executives (i.e. CEO, CIO or CFO) or corporate IT professionals. Decisions in feudal arrangements remain autonomously with business units.   The federal archetype constitutes the middle ground between centralised and decentralised governance forms while the IT duopoly archetype represents an agreement between business units and the technical units. The anarchy archetype is a very decentralised form where each individual user or small group makes their own IT decisions.   The study showed that senior management, who are able to accurately describe their IT governance approach, turned out to be the most important predictor of high governance performance.

2.6.9   *Summary of Research-Based Frameworks*

As confirmed by Brown & Grant (2005, p. 707), previous research into IT governance tends to focus on one stream or the other and thus research paths seldom intersect. The work of Weill & Ross (2004a) however, not only advanced previous research but also effectively integrated a number of the disparate threads. For example, the traditional type of organisation form (centralised, decentralised and federal designs) was expanded by

incorporating "who makes decision" and "who has inputs" into the governance structure to produce the six archetypes.

Table 2.2 summarises definitions and key phrases that explicitly defined and described IT governance for each researcher discussed above. This table helped to create an initial understanding of the dimensions required for a theoretical IT governance framework which was developed in this study.

2.7   Classification of IT Governance Dimensions

The above two sections of this chapter have laid the foundation for developing an IT governance theoretical framework. The next stage is to establish a basis from which to extract the dimensions for IT governance. This can be done as follows:

- Understanding where decision-making posits within IT governance (inward perspective);

- Understanding the components that impact on IT governance (outward perspective).

Decision-making is supported by three components: What decisions to make? How decisions are make? Who makes decision? Previous literature has suggested that the decision to make is by "nature" of each decision (Vitale, 2001; Weill & Ross, 2004a). This should be supported by appropriate structures, processes and mechanisms in order to allocate IT decision authority and enable desirable behaviour. Depending on the type of decision, this involves different stakeholders for different levels of input or decision. Since IT governance is about the type of IT decision rather than any particular decision, the term "IT decision domain" is more appropriate for this study.

Table 2.2: Summary of Key Phrases in IT Governance

Item	Authors / Organisations	Definitions	Keywords / Key Phrases identified in Literature
1	ITGI (2003, p. 10)	The responsibility of the Board of Directors and executive management. It is an integral part of enterprise governance and consists of the leadership and organisational structures and processes that ensure that the organisation's IT sustains and extends the organisation's strategy and objectives.	• Responsibility of the Board of Directors and executive management • An integral part of enterprise governance • Consists of the leadership • Organisational structures • Processes • Organisation's IT sustains • Extends the organisation's strategy and objectives • Val IT, COBIT, ITIL®, ISO17799
2	Australian Standards AS8015:2005 (2005)	The system by which the current and future use of ICT is directed and controlled. It involves evaluating and directing the plans for the use of ICT to support the organisation and monitoring this use to achieve plans. It includes the strategy and policies for using ICT within an organisation.	• System • Current and future use of ICT • Direct and control • Evaluating and directing the plans • Use of IT to support the organisation • Monitoring this use to achieve plans • Strategies and policies for using ICT within an organisation
3	Brown and Magill (1994, p. 371),	The locus of responsibility for IT functions.	• Locus of responsibility • IT function • Centralised, decentralised, recentralised
4	Henderson et al. (1996, p. 27),	The allocation of decision rights to the key executives or partners" for IT activities.	• Allocation of decision rights • Key executives or partners • IT activities • Clearly delineated decision rights • Roles responsibilities • Focus of control • Not daily operational decision • Distribution of decision rights

Table 2.2: Summary of Key Phrases in IT Governance

Item	Authors / Organisations	Definitions	Keywords / Key Phrases identified in Literature
5	Sambamurthy and Zmud (1999, p. 261).	The patterns of authority for key IT activities.	▪ Pattern of authority ▪ Key IT activities ▪ Governance arrangement ▪ IT-related authority patterns ▪ Direct, control and coordinate
6	Vitale (2001)	The process of making decisions about IT and monitoring IT performance.	▪ Process ▪ Making decisions about IT ▪ Monitoring IT performance ▪ Sharing IT decision rights across the organisation ▪ Pattern of decision making ▪ Accountability ▪ Types of decision (accountability, monitoring, strategy and policy) ▪ Transparent IT decision making ▪ Clear accountabilities ▪ Acceptable and actionable IT measurement ▪ Who makes decision ▪ How are they [decisions] made
7	Van Grembergen (2002, p. 1)	Organizational capacity exercised by the board, executive management and IT management to control the formulation and implementation of IT strategy and in this way ensuring the fusion of business and IT.	▪ Organisation capability ▪ Exercise by ▪ Board, executive management, IT management ▪ Control the formulation and implementation ▪ IT Strategy ▪ Fusion of business and IT ▪ IT governance structures ▪ Processes ▪ Relational mechanisms ▪ Integration ▪ Coordination

Table 2.2: Summary of Key Phrases in IT Governance

Item	Authors / Organisations	Definitions	Keywords / Key Phrases identified in Literature
8	Schwarz & Hirschheim (2003, p. 131)	The IT related structures and architectures (and associated authority pattern) implemented to successfully accomplish (IT Imperative) activities in response to an enterprise's environmental and strategic imperative.	- IT related structures and architectures - Associated authority pattern - Implement - Accomplish - IT imperative - Activities - In response to - Enterprise's environmental and strategic imperative - Platform logic for organising IT activities - IT capabilities - Relationship architectures - Integration architectures - Deliver the capabilities and the mechanisms - Link to capabilities - Connect and activate structural frameworks - Create relationship with the business unit
9	Peterson (2004a, p. 7)	The distribution of IT decision-making rights and responsibilities among different stakeholders, and the procedures and mechanisms for making and monitoring strategic decisions regarding IT.	- Distribution of IT decision-making - Responsibilities - Different stakeholders - Procedures and mechanisms - Making and monitoring strategic decisions regarding IT - Effective coordination - Allocation of formal IT decision-making authority - Coordination of IT decision-making expertise and influence (informal authority) - Transparent, efficient and flexible mode - Build and create IT capabilities - Direct and coordinate - Integration - Structural capability - Process capability - Relational capability

Table 2.2: Summary of Key Phrases in IT Governance

Item	Authors / Organisations	Definitions	Keywords / Key Phrases identified in Literature
10	Weill and Ross (2004a, p. 8)	Specifying the decision rights and accountability framework to encourage desirable behaviour in the use of IT.	• Specifying decision rights • Accountability framework • Encourage desirable behaviour • In the use of IT • Governance arrangement matrix • IT decision domains (business monarchy, IT monarchy, feudal, federal, IT duopoly, anarchy) • Commitment and participation • Awareness and understanding

In respect of components that impact on IT governance, there are clearly defined dimensions that were found in the literature.   Two of these dimensions (structures and processes) have been widely adopted in IT governance as they represent the two most historical and prevalent views of IT governance. Also people dimension has been referred repeatedly as an important element in making IT governance effective. For example, van Grembergen (2002) emphasises "the organisation capability" which includes human skills.

Based on the key phrases listed in Table 2.2 and the broad IT governance dimensions identified above, namely Structures, Processes, People and IT Decision Domains[5], groupings of the key phrases were selected and a summary is shown in Appendix A. A detailed description of each dimension is provided in the next section.

2.8   Dimensions of IT Governance

The four most critical IT governance dimensions identified in this review comprise:

- Structures
- People
- Processes
- IT Decision Domains

Each of these is assessed in more detail below.

2.8.1   *Structures*

Structures refer to the "existence of responsible functions such as IT executive and accounts and a diversity of IT committees" (van Grembergen & de Haes, 2005, p. 1). According to the research conducted by Weill and Ross (2004a), an effective IT governance structure is the single most important predictor of whether an organisation will derive value from IT. De Haes & van Grembergen (2004) confirmed that effective IT governance is

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[5] The purpose of each organisation is to achieve goals but since the goals that each organisation pursues are different and depend on the organisational context and needs, it was not part of this study.

determined by how the IT function is organised and where the IT decision-making authority is located within the organisation.

2.8.1.1   IT Organisational Structure

There are three basic forms of IT organisational structure: centralised, decentralised and federal (C. V. Brown & Magill, 1994; Schwarz & Hirschheim, 2003). Many contemporary organisations opt for the federal structure, with various degrees of centralisation in infrastructure and decentralisation of business applications across the organisation (de Haes & van Grembergen, 2004) to balance the benefits from both organisational forms. Researchers generally concur that centralised organisations tend to adopt a centralised IT governance design and decentralised organisations tend towards decentralised IT governance (A. E. Brown & Grant, 2005).

2.8.1.2   IT Governance Design

An effective governance design encompasses "a rational set of arrangements and mechanisms harmonised with strategy, structure, and desired outcomes" (Weill & Ross, 2004a, p. 183). For example, committees provide a formal and effective mechanism for organisations to make decisions. The IT strategy committee reviews and approves IT strategy which provides high level direction and control over IT to deliver value and manage risks whilst the IT council committee considers different levels of policies and investments (van Grembergen, de Haes, & Guldentops, 2004). Different committees encompass different memberships and authority. However, Weill & Ross (2004b) suggest that the number of governance mechanisms should be limited to maintain effectiveness.

2.8.1.3   Decision Behaviour

Decision-making behaviour concerns the decision rights of those that have inputs and those that makes decisions. IT decisions not involve only IT professionals but also business management and business professionals.

Based on different memberships involved in different types of IT decisions, Weill & Woodham (2002) categorised decision-making behaviour into six archetypal approaches:

- **Business monarchy.** Executive management has decision rights, exercised through executive committees or IT Councils which are composed of business and IT executives.
- **IT monarchy.** IT executives have the decision rights, exercised through CIO or similar levels.
- **Feudal.** Business leadership have decision rights. Authority is localised.
- **Federal.** Governance rights are shared by a mix of executives, business leaders and process owners.
- **Duopoly.** Rights are shared by IT executives and business leaders.
- **Anarchy.** Individual process owners or end users have decision rights. There are normally no formal mechanisms for exercising rights, thus decisions are made ad-hoc.

2.8.2   People

2.8.2.1   Leadership

As stated by ITGI (2003), IT governance consists mainly of leadership to ensure that IT is sustained and extended to achieve the organisation's goals. Van Grembergen (2000) concurred but added that one of the key factors for IT governance is the organisational capacity exercised by the board, executive management and IT management. As defined by Henderson et al. (1996), organisational capability refers to the human skills and the capability that are required to support and shape the business.

The emphasis on leadership is confirmed by Weill (2004); they found that the factor that most segregates top-performing organisations from substandard-performing organisations is the level of leadership by business and senior managers in key IT decisions. As they explained, IT governance is driven from the top and this is the most critical success

factor for implementing effective IT governance. Leadership should be pro-active and strategic (Broadbent, 2003) which requires commitment and behaviour which subsequently leads to allocating resources, attention, and support to business processes (Weill & Ross, 2004b). They emphasised transparency and the need to educate everyone in the organisation on how governance decisions are made in order to reduce the mystery of IT and encourage managers to accept responsibility for effective IT use.

2.8.2.2 Roles and Responsibilities

It is widely accepted that while IT is an enabler to business, IT cannot deliver value itself. Value is produced through the individual or group who manages the execution of IT. IT governance will not succeed without suitable staffing. Importantly, the emphasis of IT governance should be on the involvement of directors and senior management. They personally are accountable for IT governance. Therefore, an important emphasis in IT governance is the clear and unambiguous roles and responsibility for the board of directors and the well-defined identification of involved parties (de Haes & van Grembergen, 2004). The implementation of IT governance may require organisations to rethink their structure and individuals to re-learn their roles and relationships (Weill & Ross, 2004b).

2.8.2.3 Commitment and Participation

Leadership requires commitment and the greater the involvement from senior managers, the better governance performance is likely to be (Weill & Ross, 2004b). When senior management involves itself in IT decision-making, the organisational culture also changes; staff will buy into the concept of, and commit to, IT governance.

2.8.2.4 Awareness and Understanding

IT governance is not only about awareness of this topic but more importantly, it is about understanding. As Weill & Woodham (2002) found,

the ability of senior management in leadership positions to accurately describe their IT governance approach is the most important predictor of governance performance. The better managers are able to describe IT governance, the higher the level of governance performance. Such an understanding causes IT governance to be ingrained into the organisation's management culture.

2.8.3   *Processes*

There are various frameworks, mechanisms, techniques and tools supporting the implementation of IT governance (Broadbent, 2003). For this study, IT governance processes are studied in the following areas: tools and technique, alignment, communication and performance tracking (see Figure 2.11).
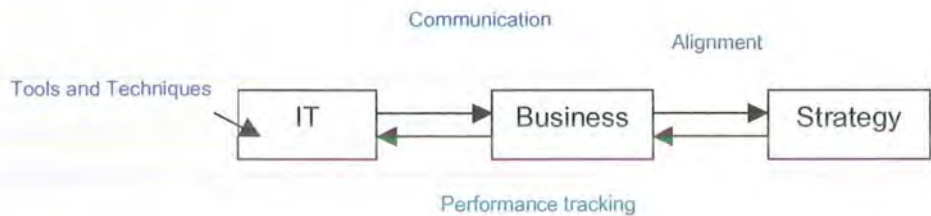
Figure 2.11: Processes involved in IT Governance

2.8.3.1   Tools and Techniques

Henderson et al. (1996, p. 28) define IT process as "the choice that defines the work processes central to operations of the IS infrastructure, such as systems development or operations". They are technical in nature and reflected in frameworks such as Val IT, COBIT, ITIL® and ISO17799. The purposes of the processes and mechanisms contained within the frameworks are to control and direct IT from the highest level and to achieve their respective IT objectives such as risk management or value management.

2.8.3.2 Alignment

One of the primary objectives of IT governance is to ensure strategic alignment between IT and business. Strategic alignment ensures that IT projects are aligned with strategic business objective, funded and prioritised. Alignment maintains a balance between daily operations and the exploration of new potentials to transform the organisation. It creates a dynamic process so that organisations can link back to IT capabilities and sustain their strategic capabilities (Schwarz & Hirschheim, 2003).

2.8.3.3 Communication

As Weill & Ross (2005, p. 28) found, "a huge barrier to effective IT governance is the lack of understanding about how decisions are made, what processes are being implemented and what the desired outcomes are." IT governance aims to create a coordinated mechanism to integrate objectives and establish measurable goals and to communicate this approach. De Haes & van Grembergen (2004) emphasised that organisations need to use governance mechanisms to coordinate structures, tools, processes and their interrelationships.

2.8.3.4 Performance Tracking

Notwithstanding the effectiveness of IT governance implementation, organisations still need to measure the performance and the effectiveness of their IT governance, so that improvements can be achieved and the positive outcomes sustained. As van Grembergen & de Haes (2005) suggest, organisations need to find a good balance of measures between output and performance, comprising technical measures and business measures. Technical measures evaluate technical-related issues (internal perspective) such as downtime and percentage access failure. Business measures evaluate business-related issues (external perspective) such as the customer satisfaction.

2.8.4   IT Decision Domains

IT governance is less concerned about "what" specific IT decision are made; it is more concerned with who make IT decisions. According to Vitale (2001), IT decisions are in the form of a pattern of decision making rather than a structure or a list of decisions that need to be made. Weill & Ross (2004b) concur and stress that the starting point for any form of governance is to understand the type of decisions to make. Thus, IT decision domain refers largely to the nature of decision-making.

IT governance looks at IT from the highest level with the aim of making decisions in a broad direction. Furthermore, the use of IT decisions needs to balance the full spectrum of IT portfolios. According to a survey conducted by Forrester Research (cited in PricewaterhouseCoopers, 2006b), organisations spent 73% of the IT budgets just to maintain the IT activities of the organisation while the balance 27% is spent on new IT initiatives. By including the IT decision domain as part of IT governance, organisational performance is improved by balancing risks and returns, and viewing IT from both current and future perspective. Weill & Ross (2005) divided IT decisions into the following five domains:

- **IT principle:** this is mainly concerned how IT is used to create business value.
- **IT infrastructures strategies:** how organisations build and sustain shared and reliable services to meet business goals.
- **IT architectural:** technical standards and guidelines that are used to create an IT system and how IT security is managed.
- **Business application needs:** applications that must be acquired to meet business requirements.
- **IT investment and prioritisation:** investment processes to IT-enabled business initiatives, for example, how much and where to invest, how to progress, justify and approve the investment and to ensure accountability.

2.8.5 Summary of IT Governance Dimensions

Based on the above analysis, the four key IT governance dimensions can be divided into sub-dimensions thereby adding depth to the understanding of IT governance. Table 2.3 summarises the list of dimensions[6] identified through the discussions above.

Table 2.3: Summary of IT Governance Dimensions and their Sub-Dimensions

Dimensions	Sub-Dimension
Structure	• IT Organisational Structure • IT Governance Design • Decision-Making Behaviour
People	• Leadership • Roles and Responsibilities • Commitment and Participation • Awareness and Understanding
Processes	• Tools and Techniques • Alignment • Communication • Performance Tracking
IT Decision Domains	• IT Decision Domains

2.9 Chapter Summary

This chapter examined the existing literature in relation to the origins and foundations of governance and the development of IT governance. Several IT governance frameworks from both best practice-based and research-based origins were evaluated to illustrate the various perspectives that currently exist. A theoretical basis was developed by synthesising these frameworks; this will form the foundation frame to the research methodology outlined in Chapter 3.

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[6] The dimensions represented in this study are the underlying concept of IT governance. They refer to the concepts and tools that are used for applying, implementing and developing IT governance (Webb, 2006).

CHAPTER 3 - RESEARCH METHODOLOGY

3.1   Introduction

This chapter reviews different research approaches and describes the methodological choice used for this study (case study methodology). It begins by examining research philosophy from a theoretical perspective. The rationale for adopting the chosen research approach is discussed and justified. This includes framing the paradigms and evaluating diverse aspects of the chosen approach. The research design including sampling design, procedures, instrument used, the data collection process and data analysis methodology are outlined. Lastly, issues related to the reliability and validity of the research methodology are discussed.

3.2   Research Philosophy

Theoretically, the design and choice of methodology are driven by the research objectives. However, as Truex, Holmstrom & Keil (2006, p. 1.5) explain, there are several factors that can influence the choice of method, including the:

- research problem or question to be investigated;
- object of the study;
- experience, training, and methodological preferences of the researcher;
- researcher's theoretical lens;
- degree of uncertainty surrounding the phenomenon;
- theory governing the research.

While not all factors are easily managed, as Knight (1996, p. 149) explains, "all dimensions of the research process are indelibly linked, in one way or another, to theoretical considerations". Therefore, the researcher should be aware of his / her own theoretical position as it greatly assists in defining

the research problem and underpinning the methodology chosen for the study.

The purpose of this study is to examine how IT governance is adopted in organisations, therefore a qualitative approach appears to be more appropriate methodology than a quantitative approach. In the following section, the theoretical basis and the rationale for this choice are explained.

3.3   Qualitative Research

3.3.1   Introduction

Research can be classified as qualitative or quantitative. Merriam (1998, p. 5) defined qualitative research as "an umbrella concept covering several forms of inquiry that help [us] understand and explain the meaning of social phenomena with as little disruption of the natural setting as possible." In a situation where the investigated area is relatively unknown or unexplored, or the research subject is still in its early stages of research, the qualitative approach is preferable since it allows researchers to investigate and identify emerging themes.

In contrast, quantitative research is more suitable in situations where researchers know clearly what to look for in advance. It is recommended particularly during the latter stages of research. One of the important characteristics of quantitative research is that investigated features are usually classified and counted. Thus statistical models are constructed to help rigorously assess what is observed. The tools that quantitative researchers tend to use are questionnaires where data collected are in the form of numbers and statistics. Table 3.1 is a comparison of qualitative research and quantitative research as summarised by Neill (2004).

Table 3.1: Comparisons between Qualitative Research and Quantitative Research (adapted from Neill, 2004)

Qualitative Research	Quantitative Research
The aim of qualitative analysis is a complete and detailed description.	In quantitative research, features are classified, counted and be constructed to statistical models in an attempt to explain what is observed.
Recommended during earlier phases of research projects.	Recommended during latter phases of research projects.
Researcher may only know roughly in advance what he/she is looking for.	Researcher knows clearly in advance what he/she is looking for.
The design emerges as the study unfolds.	All aspects of the study are carefully designed before data is collected.
Researcher is the data gathering instrument.	Researcher uses tools, such as questionnaires or equipment to collect numerical data.
Data is in the form of words, pictures or objects.	Data is in the form of numbers and statistics.
Qualitative data is more "rich", time consuming, and less able to be generalised.	Quantitative data is more efficient, able to test hypotheses, but may miss contextual detail.
Researcher tends to become subjectively immersed in the subject matter.	Researcher tends to remain objectively separately from the subject matter.

At the heart of this study is an attempt to gain an understanding of the phenomenon of the actual use of IT governance in organisations; this topic has not been extensively explored. Given that IT governance is still an emerging theme, a qualitative approach seems more appropriate. Benbasat, Goldstein, & Mead (1987) and Walsham (1995) stress that a qualitative approach is especially suitable for studying phenomena in which little prior research has been conducted and is not yet supported by a sound theoretical foundation. In addition, qualitative research, such as naturalistic inquiry, hermeneutic inquiry, grounded theory and ethnography, allow researchers to study phenomena to a greater extent and depth than quantitative methods (Patton, 1990).

Founded on the variance between ontological[7] and epistemological[8] perspectives, Myers (1997) proposed three underlying paradigms under qualitative research: positivist research, interpretive research and critical research (see Figure 3.1). As he explained, "all research (whether quantitative or qualitative) is based on some underlying assumptions about what constitutes 'valid' research and which research methods are appropriate". In the following section, the underlying philosophical assumptions of each type of qualitative research are examined.

Influences / guides

Underlying
epistemology
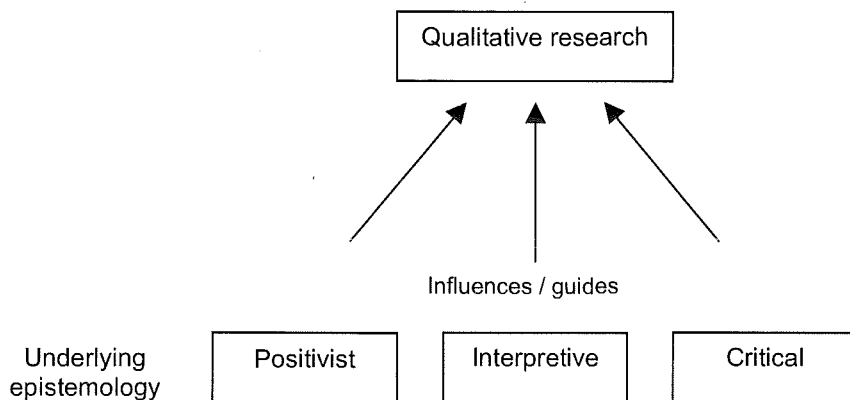
**Figure 3.1: Underlying Philosophical Assumptions
(adapted from Myers, 1997)**

3.3.2   *Positivist Research*

In positivist research, researchers assume that both the natural world and human society are objectively given and measurable properties, which are independent of the observers (researchers) and the instruments employed, can be used to describe their state (Myers, 1997). It is a philosophy where free will, emotion, chance, choice and morality are not part of the investigated subjects. The intention of positivist studies is to increase the predictability of a phenomenon by theory testing. Examples of positivist studies are hypothesis testing, quantifiable measures of variables and making inferences about a phenomenon based on a sample relative to a stated population.

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[7] Wand and Weber (2004, p. iii) define ontology as "the branch of philosophy that deals with theories about the structure and behavior of the worlds that humans perceive. Ontologists seek to articulate the fundamental types of phenomena that exist in the world and the relationships that can arise among these different types of phenomena."

[8] Hirschheim et al. (1995, p. 20) denote epistemology as "the nature of human knowledge and understanding that can possibly be acquired through different types of inquiry and alternative methods of investigation."

3.3.3   Interpretive Research

In interpretive research, researchers believe that the social world and human knowledge are co-habited and intertwined. Human life can only be understood from within and is a human product. Understanding of reality, whether given or socially constructed, is only achieved through social constructions such as language, consciousness and shared meaning (Myers, 1997). The philosophical ground of interpretive research is hermeneutics (a process of interpretation which focuses on the meaning of a text or text-analogue) and phenomenology (a process to understand the meanings of people and situations through their subjective experiences). The understanding of the phenomenon is through the meanings people assign to it. Therefore, the espoused method requires the understanding of the context of the subject, and the process of being influenced by the subject itself or the subject's context (Walsham, 1995). The centre of interpretive research is the complexity of how human beings make sense of situations as they emerge, rather than through pre-defined dependent and independent variables.

3.3.4   Critical Research

In critical research, researchers believe that there is no pre-cultural or pre-linguistic knowledge. Reality is historically and socially contingent, mediated by power-relations (e.g. social, cultural, political domination) which constrain people's ability to act or change their social economic circumstances. The focus of critical research is to help eliminate the causes of alienation and any domination conditions of status quo. It seeks to be emancipatory by focusing on the oppositions, conflicts and contradictions in the existing world (Myers, 1997).

3.3.5   Views of the Researcher

An interpretivist approach which employs qualitative research methods is used in this study. It is the most appropriate choice for this study. Since this study examines how IT governance is adopted by organisations, a positivist approach is not considered suitable given that it assumes the existence of objective or value-free data and quantifiable measures of the

variables.   Secondly, critical research is not considered either due to its focus on historical and power-related factors that are not examined in the study.

Conversely, the interpretivist approach offers better insights for practice than the other two approaches.   It seeks to draw meaning from social context rather than identifying or testing variables.   It also puts people's words, observations and documents together into a coherent picture expressed through the voices of participants (Trauth & Jessup, 1999). Practitioners relate better to interpretive research since it involves real people in real situations and is undertaken in real life settings.

Furthermore, the choice of an interpretivist approach was consistent with the theoretical perspectives of the researcher.   From the ontological perspective of the researcher, people's own experience, knowledge, interpretations and interactions are meaningful properties of the social reality which this study examines.   From the epistemological perspective of the researcher, the most justifiable method to answer inquiries based on these ontological properties is by discourse; that is to interact with people, talk to them and listen to them in order to gain access to their accounts and articulations.   Based on the researcher's fifteen years of professional experience, direct communication is the most effective way of gaining insights of such phenomena.

3.4   Research Methodology

As discussed above, qualitative research covers a plurality of research paradigms.   Within each type of qualitative research approach, there are a range of research methods, research processes and techniques (Carroll & Swatman, 2000).   As Silverman (1998, p. 7) argues, "there is no agreed doctrine underlying all qualitative social research", the shared aspect is the collected data which is usually in the form of images and words.   Choice of an appropriate research methodology needs to be carefully considered and crafted.   There are four main research methods which fall within the interpretative approach: action research, ethnography, grounded theory

and case study research. Each of these methods is evaluated to identify the most appropriate one for this study.

3.4.1   Action Research

Winter's (1996, p. 14) defines action research as "the ways of investigating professional experience which link practice and the analysis of practice into a single productive and continuously developing sequence." It is especially useful in real life situations where change and understanding are sought but variables are not readily controlled because of the evolving and complex circumstances. In this type of research, participants are actively involved in the research process and the researchers, who may also be the participants, would apply the outcomes back to the subject organisations. At the centre of this methodology is the looped type self-reflective inquiry that links reflection and action closely. Participants self-learn and take control of their own situation.

However, since intervention was not intended within the case organisations and the time required for observable outcomes, action research was ruled out as a suitable method for this study.

3.4.2   Ethnography

Ethnography is a form of research originally derived from the discipline of social and cultural anthropology (Myers, 1999). Ethnographic research questions are normally framed around the linkage between culture and behaviour and/or how cultural processes develop over time. As Myers (1999) notes, "the main difference between case study research and ethnographic research is the extent to which the researcher immerses himself or herself in the life of the social group under study". Ethnographers are required to spend a vast amount of time in the field by immersing themselves in the lives of the people they study as well and to explore the social and cultural context of the phenomenon studied. Another characteristic of ethnographic research is that data sources are supplemented by data collected through participant observation where detailed, observational evidence is emphasised (Yin, 1994).

As the intention of this study was not concerned with the link between culture and behaviour, no extensive periods of fieldwork were planned, and participant observation was not the major source of data collection, ethnographic research was not considered a suitable approach.

3.4.3   Grounded Theory

Martin and Turner (1986, p. 141) define grounded theory as "an inductive, theory discovery methodology that permits the research to develop theoretical accounts of general feature of a topic while grounding the account in empirical observations or data." Grounded theory moves from the specific to the more general, contrasting with the deductive approach in which theory can be derived before data is examined. The concept underpinning grounded theory is the continuous interaction between data collection and analysis.

Grounded theory was not considered appropriate as a method for this study in view of the fact that a theoretical framework was developed (set out in Chapter 2 of this thesis) prior to data collection and analysis.

3.4.4   Case Study Research

Yin (1994, p. 13) defined case study research as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used." The strength of the case study approach is the depth and breadth of data that can be collected. It allows researchers to ask insightful questions, to examine and develop an understanding of the complex real world in its natural context, to capture the richness of an organisation's behaviour and to offer opportunities for comprehensive and deep analysis of the subject.

Walsham (1995) argues that case study research is a favoured approach in exploring the use of IT in a social context and can yield rich insight, particularly in relation to the evolution and the progress of information

systems. In instances where insight into emerging topics (such as the "how" and "why" questions) is needed but the control of behavioural events or variables is not required, case study methodology is a preferable choice (Benbasat et al., 1987).

After examining various factors which included the research philosophies, research methodologies in qualitative research, time and resources available and the capability of the researcher, the case study methodology was selected as the most appropriate choice for this study. In the next section, justifications for this methodological choice are discussed further.

3.4.5   *Justification of Case Study Methodology*

At previously noted, the choice of research method can be driven by numerous factors such as the research problem or question, the theory governing the research, the capability and preference of researcher and the externalities of the research. Researchers can choose a method either driven by the research objective or an approach that fits their own paradigms.

IT governance is still an emerging and contemporary phenomenon where there is little research guidance and a limited number of organisations actually have IT governance in place. Quantitative research, drawing on a large number of samples, would not be feasible.

Defining the research questions is a significant step in guiding the choice of research method and design since research questions not only determine the domain of the study, but also direct data collection and interpretation. The empirical part of the study must set a scene where natural and real life contexts are the backdrop and specific instances (one or a few cases) would be chosen in order to illustrate how IT governance is exhibited compared to the theoretical framework.

Finally, the second research question of this study is the "how" question which requires an appropriate research strategy. Case study uses the interview method to yield rich and in-depth data by asking insightful

questions such as "how" and "why" rather than addressing the frequency of the incidences as in quantitative research. This is even more important since in this instance, because of emerging and contemporary nature of IT governance, the boundaries between phenomenon and context are still not clear. The researcher has no control over the actual IT governance practice within the case organisations.

Based on the above analysis, it was confirmed that the case study method was the most appropriate method for this study. In addition, the focus of the research shares many similarities with those proposed by Benbasat et al. (1987). These are summarised in Table 3.2.

Case study research can be used with a range of philosophical perspectives, such as positivist, interpretivists, or critical. Though this study may be more inclined to the interpretivist research, Weber (2004) argues that researchers should move beyond simply labelling themselves as positivist researchers or interpretive researchers since research processes and the objects that positivists and interpretivists study are "inextricably related". There is an "underlying unity" in what they are endeavouring to achieve via their research methods.

3.5   Research Design

The stages of research for this study, presented in Figure 3.2, were adapted from the research process originally proposed by Yin (1994). The process is divided into three main stages:

- Define & design
- Prepare, collect and analyse
- Analyse and conclude

Table 3.2: Characteristics of Case Studies (adapted from Benbasat et al., 1987)

Item	Characteristics	This Research
1.	Phenomenon is examined in a natural setting.	All interviews were conducted at the research participants' own offices (their natural setting).
2.	Data is collected by multiple means.	Data was collected using various means including: • Interviews; • Content analysis of current documents which were made available online.
3.	One or a few entities are examined.	CIO or IT Director of each of case organisation was interviewed.
4.	The complexity of the unit is studied intensively.	Insightful questions were asked and the answers were analysed within the context of organisations.
5.	Case studies are more suitable for the exploration, classification and hypothesis development stages of the knowledge building process; the investigator should have a receptive attitude toward explorations.	This study was to compare the dimensions that organisations were using with the ones identified and synthesised in the literature. It is for the purpose of framework development.
6	No experimental controls or manipulation are involved.	Data was collected in a natural settings and no experimental controls or manipulation were involved.
7.	The investigator may not specify the set of independent and dependent variables in advance.	The researcher specified a list of four main dimensions and their respective sub-dimensions in advance to this study.
8.	The results derived depend heavily on the integrative powers on the investigator.	The results were derived based on the researcher's ability to analyse the data from different data sources (see Triangulation in Section 3.6.3).
9.	Changes in data collection methods could take place as the investigator develops new hypotheses.	Data sources and data collection were supplemented by other sources (i.e. online resources from the cases' websites for content analysis).
10.	Case research addresses "why" and "how" questions, rather than frequency or incidence.	This research mainly focused on the "how" and "why" questions but not the frequency or incidence.
11.	The focus is on contemporary event.	IT Governance is a recent and contemporary phenomenon.
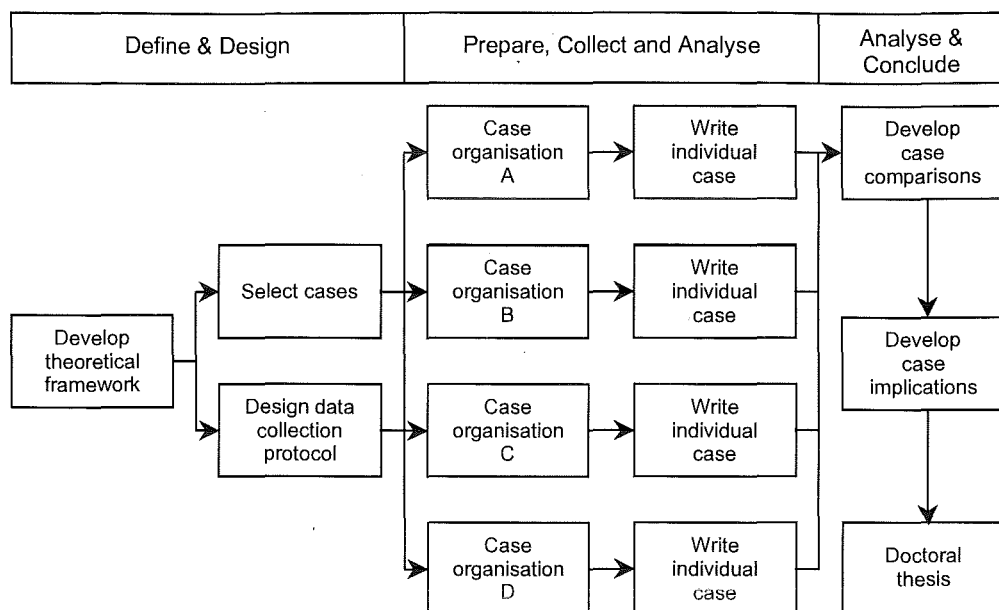
Figure 3.2: Research Process (adapted from Yin, 1994)

3.5.1   Theoretical Framework Development

Yin (1994) argues that the research process in case study design should start with theory development as an initial stage to identify a theoretical framework which would give strength, via the literature, to identifying gaps in the research.   This study has adopted Yin's recommendations to incorporate a literature review as the first step (as in Chapter 2) and developed a theoretical framework in the form of IT governance dimensions. This answers the first research question:

Research Question 1:	**What IT Governance dimensions can be extracted from current theoretical frameworks and best practice frameworks?**
Research Question 2:	**How are these dimensions reflected in practice?**

To answer the second research question, the theoretical dimensions were examined in a real-life context to see how it reflects practice. To do that, one or more cases must be chosen. This study is a multiple case study with the intent of describing the phenomenon in real life situation. Multiple case designs are desirable when the intent of the research is description, theory building or theory testing (Benbasat et al., 1987).

In the following section, the process of selecting and defining the cases is discussed followed by the design of data collection protocol used in the data collection process.

3.5.2   *Cases Selection*

This stage includes the following processes:

- Identifying appropriate type of cases and organisations through case sampling selection and case definition;
- Outlining ways of gaining access to organisations and respondents;
- Planning the methods for collecting, recording, and processing and analysing data (and related criteria for rigour and validity).

3.5.2.1   Case Sampling Selection

There are two issues to be dealt with in case sampling selection: (1) how to draw the sample; (2) the number of organisations required for the study. Careful selecting and defining the case are imperative as they constrain extraneous variables as well as sharpen the external validity (Eisenhardt, 1989). However, the researcher is required to acknowledge and work under the limitations of the study; time and resources are the most substantive constraints to this study.

Case study is known for its subjective approach. Researchers in the field, such as Yin (1994) and Stake (1995), refute that case study research is sampling research; hence a representative sample is not required in this methodology. Organisations should be chosen because they are special enough to allow the researcher to gain insights that other organisations

could not provide (Siggelkow, 2007). Merriam (1998) argues that probability sampling is not necessary nor justifiable in qualitative research; thus the selection of qualitative research samples is often non-random, purposeful and small. Siggelkow (2007) states that a representative sample is just a mismatch of method and goals. If the aim is to achieve representative sampling, another methodology should be chosen instead. Based on the above reasons, a non-probabilistic and purposeful sampling method was used to choose the target organisations.

Since sampling logic is not used in multiple case study research, the typical criteria regarding sample size becomes irrelevant (Yin, 1994). As suggested by Eisenhardt (1989), the number of cases chosen in multiple case study research are often arbitrary and constrained by time and funding. Travel time and cost were major concerns in selecting cases for this study[9]. Also, this study aimed at producing contrasting results for predictable explanations ("theoretical replication") rather than producing intended similar results ("literal replication") (Yin, 1994, p. 46). According to Yin (1994), the use of multiple case studies in the range of four to six case studies could produce comparative results and be generally accepted as a theoretical replication; four case organisations were therefore selected for this study. As two IT governance goals were investigated (i.e. risk management and value delivery), the cases required must be a multiple of two.

The cases approached represented the four tertiary education institutions in Western Australia. They were selected because of their level of experience in IT governance matched with the research objectives of this study. As Yin (1994) noted, the evidence obtained from multiple cases is to make them relevant to theory but not to become the population. Multiple cases are compelling because they strengthen the results, thus increasing findings.

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[9] The cases were all located in Perth, Western Australia and readily accessible to the researcher.

3.5.2.2 Case Definition

The units of analysis of this study are the dimensions of IT Governance that organisations are using. These clarify and define what data to collect and analyse (Yin, 1994). The following outlines the selection criteria used for the selected organisations.

- **Size of the organisation.** IT governance is still an emerging and contemporary phenomenon which only limited numbers of organisations have implemented. Those organisations which have implemented IT governance are usually large organisations and/or listed companies in complying with regulatory requirements (as described in Chapter 2). It is compulsory for large organisations to have governance in place and directors are personally accountable to their shareholders and stakeholders. In addition, large organisations are usually the pioneers adopting recent initiatives as their available resources and expertise are greater than those of small businesses.

- **Respondents.** IT governance is a top-down approach and the ultimate responsibilities and accountabilities lie with senior management. Research participants were targeted at IT Director / Chief Information Officer (CIO) level representing the relevant senior level of the organisation. They were identified as the ones who possess the IT governance knowledge and familiarity with IT governance practices within their respective organisations.

- **Scope (the IT governance goals to achieve).** ITGI (2002) defined five domains of implementing IT governance: strategic alignment, value delivery, risk management, resource management and performance management (see Chapter 2). Due to the constraints of time and resources, the scope of this study was narrowed to risk management and value delivery which represent the two major concerns of IT governance highlighted by ITGI (2003). The growing concerns with IT risks have required organisations to practise risk management to safeguard information. IT governance offers ways of mitigating this risk and also achieving regulatory compliance and

business continuity. Conversely, the ever-increasing IT investment has encouraged organisations to harness and exploit IT to deliver business value and justify their investment. IT governance improves organisations' overall value performance.

3.5.2.3 Gaining Access to Organisations and Respondents

Initial contact with the four universities was made via email. The purpose of the email was introductory, briefly describing the research itself, time required for the interview, and seeking agreement to participate in the study. With their initial consent, another email was sent to confirm the date of interview. All four organisations approached expressed their interest in participating in the study. Table 3.3 is a summary of the interview schedule that was arranged and the specific goals of IT governance.

Table 3.3 : Interview Timetable

Organisation	Domain of IT Governance	Date and duration of interview
Case organisation A	Risk management	Early Sept 07 (1.5 hours)
Case organisation B	Risk management	End October (1.25 hours)
Case organisation C	Value delivery	Early Oct 07 (1.25 hours)
Case organisation D	Value delivery	Mid October (1 hours)

3.5.3 Case Study Instrument and Protocol Development

Yin (1994) proposes to use a Case Study Protocol (CSP) to guide the researcher in the collection of data. It outlines a set of guidelines, procedures and rules that can be used to structure and govern the conduct of researchers before, during and after a case study research project. It includes details of the questions being asked, field procedures for the study, details of all types of evidence required and the structure of the final research. As Maimbo & Pervan (2005) suggest, the development of CSP can force researchers to consider all issues relevant to their study and can contribute to more rigorous (case) research with greater internal and external validity. The research procedures are more consistent and standardised which contributes greatly to the rigour of method as well as the reliability and validity of results, especially in circumstances where

multiple case studies are undertaken (Miles & Huberman, 1994; Yin, 1994). In the following sections, interview method, interview schedule, interview questions and peer review of this study will be discussed.

3.5.3.1 Interview Method

As suggested by McKernan (1996, p. 128) "one of the most effective modes of gathering data in any inquiry is through the interview method". There are three types of interview: structured, semi-structured and unstructured. In a structured interview, the underlying assumption is that questions / issues are known before the interview, therefore, the questions being asked are pre-defined and the researcher is constrained to the script of the interview. This contrasts with the unstructured interview where issues and topics are left to the participants. The outcomes of the interview are uncontrollable and the potential setback is the research interest may not be addressed. A semi-structured interview provides a balance between these two extremes, where the interview is guided by focused questions.

The semi-structured interview method was chosen for this study. First, as the nature of the research question was to investigate a recent phenomenon (i.e. IT governance) in a real-life context, the approach offered opportunities to ask participants in-depth questions about their IT governance practice which in turn their insights about IT governance practice could be collected. Flexibility is allowed through additional probing questions designed to encourage participants to provide a missing answer as well as to clarify and enlarge on a given question; an outcome that would not have been available in a structured interview. Participants were also encouraged to freely share their relevant experiences or ideas if these were not covered in the structured questions. Second, initial dimensions (or themes) were already identified during the theoretical framework development so that a structured set of questions was produced.

3.5.3.2   Interview Schedule

Interviews vary as a result of the nature of the interview method and the research questions (on using IT governance to achieve either risk management or value delivery). However, there are certain principles and techniques which need to be applied especially as this study is a multi-case study. First, a consistent structure is required for reliability, so the questions asked in this study are more or less verbatim for each of the four cases. Second, the interview schedule has three major parts: the opening, the body and the closing. The body contained the four dimensions and their respective sub-dimensions (see Table 3.4). The questions were designed to seek data on the areas identified in the research model but also to find themes that might not be covered in literature.

Part I – The Opening

The introductory questions focused on the general environment of the organisation, IT, IT governance and personal information about the research participant. The purpose was to "break the ice" between researcher and participant and gave time to both of them to establish rapport before discussing the key topics. Secondly, this part was to acquaint the researcher with the background of the case organisation and provide the contextual information that would be useful in the data analysis process.

Part II – The Body

This set of questions was more directly related to the main topic of this study, IT governance in general and particularly the four dimensions and their respective sub-dimensions that were identified in Chapter 2. Deeper questions and specific questions were drilled down during the interview process.

Part III – The Closing

This final set of the questions gave research participants the opportunity to express and share their experience and thoughts on the topic of interest as freely as they wanted. The research themes are summarised in Figure 3.3.

Table 3.4: Interview Themes of this Study

Questions	Dimensions	Purposes / Interview themes
Part I – The Opening (General questions)	1.1 Respondent's personal info (general questions)	• Background info. • What is the respondent's role and experience? This links to 2.1 as well.
	1.2 Organisation (general questions)	• Background info. • What are the organisation's goals?
	1.3 Information Technology (IT governance dimension)	• Background info. • Where does IT stand in the organisation? • What is the IT strategy?
	1.4 IT governance (general questions)	• Background info. & history of IT governance. • What is the organisation's understanding of IT governance? • What are the goals of IT governance? • How does the organisation achieve the goals? As mentioned in Section 3.5.2.2, this study focused on the topics of Risk Management or Value Delivery.
Part II – The Body (Main questions pertaining to IT governance dimensions)	2.1 Structures (IT governance dimension)	• What kind of structure in the organisation exists to support the IT governance? • How does it work? • Who has inputs and who makes decision?
	2.2 People (IT governance dimension)	• Which people (who) are involved? • How does it work? (e.g. roles and responsibilities) • What is the commitment and participation? • What is the awareness and understanding of IT governance?
	2.3 Processes (IT governance dimension)	• What processes does the organisation use? • How does it work?
	2.4 IT Decision Domains (IT governance dimension)	• What IT decision domains does the organisation use? • How does it work?
Part III – The Closing (Closing questions to share experience or insights that participants might have)	Closing questions	Closing questions are to allow respondent to share his/her thoughts pertaining to the topic that are relevant but not covered above.

1. Background information	2. Main questions	3. Closing questions
• Informant personal info. • Orgasnisation and the business. • IT. • IT governance.	• Structures • People • Processes • IT Decision Domains.	
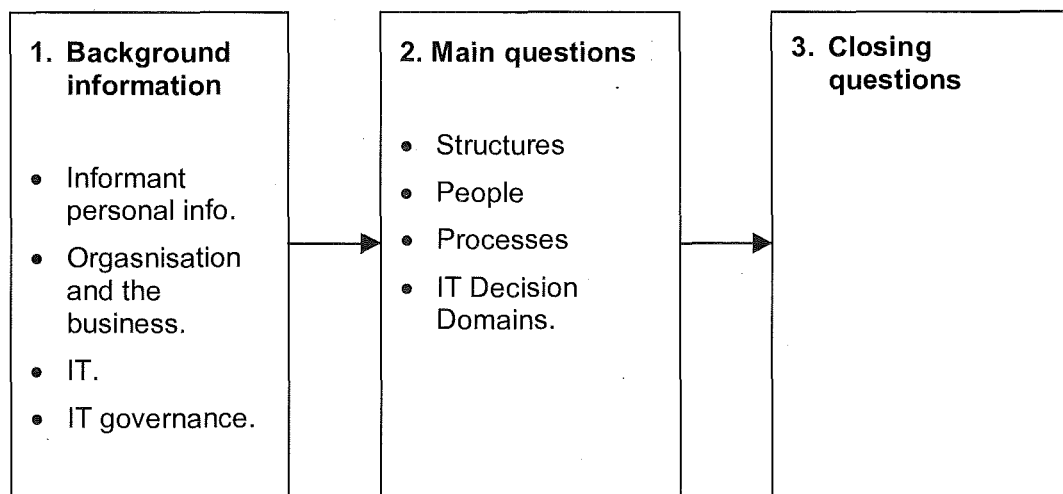
Figure 3.3: Flow of Research Themes

3.5.3.3   Interview Questions

As mentioned in Section 3.4.4, most of the research questions are "how-questions" that are typical of case study research. As Yin (1994) notes, "what-questions" can be presented as part of the "how-questions" as case studies addressing what-questions are most appropriate when the purpose of the study is to explore a new phenomenon (in this case is IT governance). As a research strategy, case studies are good for revealing the depth and complexity of situated processes or phenomena. Below are the interview questions used and the justification for their selection. A full list of the interview questions is attached in Appendix B.

Part I – The Opening

Respondent's Personal Information

Questions 1 to 2 were to find out the level of experience and the role and responsibility of the respondents. Question 3 was to find out if the respondents were clear about their responsibilities as CIOs / IT directors.

Q1 Can you please state your name and your position in the organisation?
Q2 How long have you been working with the organisation?
Q3 What is your role in the organisation?

Organisation

Questions 4 to 8 were to collect background information on the organisations. Question 4 addressed whether the CIOs / IT Directors could delineate their organisations' goals and objectives; implicitly it checked if the goals and objectives were clearly and unambiguously defined. Question 5 delineated each organisation's size for later data analysis. Question 6 investigated organisational structures as they illustrate how decisions were made and highlight IT arrangements. Questions 7 and 8 clarified who the organisation considered to be their clients and stakeholders. IT governance has a strong focus on external stakeholders.

Q4 What are the organisation's goals and objectives?
Q5 What is the size of the organisation?
Q6 What is the organisation structure like?
Q7 Who are your clients?
Q8 Who are the stakeholders of the organisation? (To whom does the organisation need to be responsible to?)

IT in Organisation

Question 9 to 12 assessed where IT stood in each organisation, whether it was an enabler or just had a supporting role in the organisation. It also clarified how senior management viewed IT. Question 9 was used to depict the roles of IT within organisations. Question 10 was investigated if there were any well-versed IT strategies and if there were linkages or alignment with overall corporate strategies (linked to Question 4). Questions 11 and 12 delineated the number of staff and the structure of IT departments.

> *Q9   What is the role of IT in the organisation?*
>
> *Q10   What is the IT strategy in the organisation?*
>
> *Q11   How many IT staff do you have in your organisation?*
>
> *Q12   What is the structure of the IT department?*

IT Governance (broad theme)

Question 13 to 19 explored the history of each organisation's IT governance, in general, and more specifically its objectives, line of responsibility and linkage to other parts of the organisation's strategy or structure. Questions 13 sought to clarify how much understanding senior management has of IT governance and what perspective they held. It also established whether the researcher and respondent shared a common language on IT governance. Question 14 assessed whether IT governance was initiated internally or externally, and if the former, whether it was by senior management or IT staff (initiation could imply commitment to it). Question 15 was used to find out whether the IT governance was implemented "as a fad" and implicitly how much awareness and commitment senior management had of IT governance. Question 16 investigated whether they understood the objectives of IT governance. Questions 17 and 18 established the respondent's roles and responsibilities in IT governance and if the roles were integrated into the CIO/IT Director's daily work. Question 19 explored the relationship between IT governance and corporate governance (in Chapter 2, the direct link between corporate governance and IT governance was highlighted).

> *Q13   In your organisation, what is the definition of IT governance?*
>
> *Q14   Who initiated IT governance?*
>
> *Q15   What are the main drivers to implementing IT governance?*
>
> *Q16   What are the objectives of IT governance in your organisation?*
>
> *Q17   What is your role in IT governance?*
>
> *Q18   Who is ultimately accountable for IT governance?*
>
> *Q19   What does IT governance link to? (Corporate governance? What is their linkage?)*

Part II – The Body

The focus of questions in Part 2 was the state and extent of IT governance implemented in the case organisations, in particular, the use of IT governance to achieve Risk Management or Value Delivery (risk management is used in the following example). The questions being asked were organised around the dimensions of Structures, People, Processes and IT Decision Domains.

Structures

Questions 20 and 21 investigated the structure (e.g. risk management committee) and the governance style (who participated in the committee) the organisations used to support risk management.

> Q20 *What structure (committee) do you have in your organisation to support IT governance to achieve Risk Management?*
>
> Q21 *How often does the Risk Management Committee meet?*

People

Question 22 assessed the level of the relevant experience of staff in IT risk management. Questions 23 and 24 sought to establish the roles of senior management (as mentioned in Chapter 2, IT governance is the senior management's responsibility).

> Q22 *What is the level of expertise in your organisation to handle IT governance to achieve Risk Management?*
>
> Q23 *Who are involved in IT governance decision making pertaining to Risk Management? Who make decisions and who has inputs?*
>
> Q24 *What part does the senior management play in IT governance and in particular Risk Management?*

Processes

Questions 25 to 26 were used to find out the various processes that organisations had used to support IT governance to achieve risk management. Question 27 identified the approach used to align IT governance to risk management and the organisations' goals. Question 28 delineated the approach used to communicate IT governance delivering risk management. Questions 29 and 30 addressed the approach used to track IT governance to achieve risk management and what was tracked (process or outcome). Questions 31 and 32 were general questions to assess how respondents felt about the outcomes from implementing IT governance. Question 33 was directed at how the organisations handled exceptions.

__Tools and Techniques__

Q25 What are the standard processes / procedures for IT governance to achieve Risk Management?

Q26 What framework do you use? Is it internally developed or externally adopted or a mix of both?

__Alignment__

Q27 What approaches does your organisation use to align IT governance with Risk Management and the organisation's goals?

__Communication__

Q28 What approaches does your organisation use to communicate IT governance to achieve Risk Management?

__Performance Tracking__

Q29 What approaches does your organisation use to track the performance of IT governance to achieve Risk Management?

Q30 What do you track? IT governance (Risk Management) itself or the benefits as a result of IT governance (Risk Management) or both?

<div style="border:1px solid">

General Questions

Q31 *What other processes / mechanisms do you use in relation to IT governance to achieve Risk Management?*

Q32 *What are the benefits of implementing IT governance to achieve Risk Management in comparison with Risk Management without IT governance?*

Q33 *If the process / procedure is not standard, how will the exception be handled?*

</div>

IT Decision Domains

Questions 34 and 35 identified which IT technical areas the organisations were looking at in order to manage risks.

Q34 *Do you divide the IT decisions by functions or by domain areas?*

Q35 *What domain areas do you look at in IT governance, in particular Risk Management?*

Part III – The Closing

Questions 36 to 38 were the closing questions to allow respondents to share their experience or thoughts that they considered important to the topic but which were not covered in the previous questions.

Q36 *In your opinion, what are the critical success factors for an IT governance implementation and in particular to achieve Risk Management?*

Q37 *In your opinion, to what extent does your organisation achieve Risk Management as IT governance?*

Q38 *Is there any other organisation's specific experience in implementing IT governance in general, or specifically as Risk Management, you would like to share with me?*

3.5.3.4 Peer Review

To ensure the validity and clarity of the interview questions, they were reviewed with two academic staff members who have expertise in IT governance. The clarity of definition, the potential ambiguity of the questions, the logic and flow of questions, the appropriateness of language, and the linkage with the research questions were scrutinised. As a result of the peer review, a number of the items in the interviews were deleted and several other items were modified. Furthermore, the researcher tested the interview with two of her working colleagues to ensure that language used was easy to understand, appropriately worded and had no vagueness.

3.5.4 Data Collection

Considering that the purpose of this research was to examine IT governance practice, empirical data and analysis are required to verify the theoretical framework developed. In Sections 3.5.3.1 to 3.5.3.3, the interview method, interview schedule and interview questions were discussed in detail since interviewing was the major method of data collection of this study. However, often multiple data collection methods are employed in case study research (Yin, 1994). For this study, there are three sources of data:

- Interviews;
- Observations;
- Documents.

According to Yin (1994), there are three principles to apply during the data collection:

- Use multiple sources of evidence;
- Create a case study database;
- Maintain a chain of evidence.

Duchon & Kaplan (1988) argue that the use of multiple data collection methods could lead to new insights and different modes of analysis. Interviews are the main component of data collection in this study. But other sources of evidence such as post-interview notes from observation, documents obtained from organisations' websites are also an important part of the research plan. Secondary sources of documents can fill the gap of what is unknown in the primary source of data; they supplement the study by offering details, facts and analysis. It allows the triangulation of data collected from interviews against other sources of data and allows any contradiction between interviews and other sources of evidence to surface. It improves the internal validity, highlights potential analytical errors and omissions, and helps to integrate the lines of inquiry.

The introduction of documentary research counteracts any potential theoretical bias, a bias that arises from making predictions or recommendations based on theories and interview data exclusively. It verifies, to a degree, that the assumptions and the predictions based on theory are correct. Other than the theoretical bias, the interview itself can also introduce bias, either from the organisations or from participants. For example, the research participant may fear the loss of position or reputation based on the answers provided. Documentary analysis helps to make implicit assumptions become more explicit.

3.5.4.1 Interviews

Interviews were conducted over a 2-month period between September and October 2007. During this period, each of the four case organisations was visited to conduct interviews with its IT Directors or CIOs. All interviews were conducted face-to-face at the participants' business premises and lasted between 1 to 1.5 hours (as shown in Table 3.3).

Interviews commenced by presenting an overview of the research. An Information Letter to Participants (see Appendix C), delineating the objectives, nature and context of the research project, was given to the participants. The participants then signed the Informed Consent Document

(Appendix D) in agreeing to participate in the study. The Informed Consent Document contains three main disclosures:

- **Considerations in data collection.** The researcher assures the participants of anonymity, privacy and confidentiality.
- **Informed Consent.** Participants are informed and understand their involvement. Participants are volunteers and therefore, there is no coercion or reward for participation. Permission was given for the researcher to audio-record the interviews.
- **Responsibility to Participants.** The researcher is obliged to minimise and foresee any risks to protect the participants.

The main advantage of audio-recording was that it provided a full description of what has been said, thus avoiding any recollection and encoding-filters bias in collecting the data, and allowed the researcher to fully focus on the interviews. However, Walsham (1995) argues that transcribing the recordings is time-consuming. Since the number of interviews was limited to four, it was determined that recording the interviews would provide more advantages than disadvantages.

3.5.4.2   Observations

Since case study research is a form of inquiry that investigates phenomena in their natural context, observations were carried out during the interview process. The researcher captured notes of her impressions (empirical observations) such as the respondent's place of business, working environment and behaviour that might be useful during the data analysis process. It provided clues or insights on some of the problems associated with this study.

3.5.4.3   Documentary Analysis

Documents found in the environment of the research were used as a further source of evidence for analysis. McKernan (1996, p. 148) maintains that documentary analysis is "a rich source of evidence for the research practitioner [and] can be found in documents, such as texts, newspapers,

minutes of meeting, articles, letter, diaries, memos or scripts – indeed any written account may be considered a document". Table 3.5 lists the documents that were collected and used for this study. The reason for drawing documentary analysis from websites is that IT governance has both an internal and external focuses to protect the interest of the organisations' stakeholders and shareholders[10]. For example, documents aimed at the public illustrate how organisations would like to be portrayed. Other documents from independent source or literature found on the websites were also reviewed if they were relevant to the study.

3.5.5 *Data Analysis*

The primary goals of data analysis are to identify patterns and interpret meanings through collating and organising textual and other forms of data. In the following sections, the methods and tools used for interpreting the data are described.

Table 3.5: List of Documents as Source of Evidence

Case	Documents
Case organisation A	• Annual reports (2005 to 2007) • Corporate Governance Statement • Council Code of Conduct • ITSC Committee Membership and Terms of Reference • Newsletters from central IT department (2006-2007) • Organisational Structure • Operational Plan 2007-2008 • Policy & Procedures: C&IT, Integrated Risk Management Policy • SIMSC Committee Membership and Terms of Reference • University Committee Diagram
Case organisation B	• Annual report (2006 to 2007) • Corporate Risk Management Framework • Decision Making and Communication Maps • IT Strategic Plan (2004) • IT Strategic Statement (2007) • Organisation Structure (2008) • Risk Management Policy • Strategic Plan (2007) • University Governance and Structure (2008)
Case organisation C	• Annual report (2005 to 2007) • Committee Diagram • IT Organisational Structure • IT Planning Process • IT Policies and Procedures Manual (2007) • Overview of Strategic Plan • Organisation's Procedures for Planning • The Role of Chancellor in Governance

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[10] Refer to the article written on endogenous perspectives (see publication at front of thesis).

Case	Documents
Case organisation D	• Annual report (2007) • Framework provided by the CIO • IT Discovery Forum – Membership and Terms of Reference • IT organisational structure • Roles and Responsibilities of Senate • Strategic Plan (2007-2010)

3.5.5.1 Content Analysis

The purpose of content analysis is to analyse the data according to the appropriate keywords. As Hussey and Hussey (1997) state, content analysis is a formal approach to analysing qualitative data and is particularly useful when a large volume of open-ended material is being assessed.

There are essentially two approaches to content analysis: the inductive approach and the deductive approach. In an inductive approach, there is no pre-defined list of codes established before coding commences. Examining the data identifies the codes, as codes are "grounded" in the data. Alternatively, the deductive approach is "a priori" approach, which uses a set of pre-defined codes or categories. Both approaches have their advantages and disadvantages. For example, in the inductive approach, it is difficult to justify underlying philosophies or attitudes expressed by participants theoretically. The deductive approach, conversely, may cause the researcher to overlook other, better ways of viewing a problem or failing to identify some important issues.

For this study, since the theoretical aspects (four dimensions and their sub-dimensions of IT governance) have been identified through an literature review outlined in Chapter 2, a deductive approach was regarded the more appropriate method. Mayrung (2000) defines seven steps to undertake deductive content analysis:

Step 1: Define the research question (see Chapter 1).

Step 2: Define the theoretical framework. This is composed of the four main dimensions of Structures, People, Processes and IT Decision Domains and their respective sub-dimensions (see Chapter 2).

Step 3: Determine and define the theoretical dimensions (coding rules for the categories).

Step 4: Revise the categories and coding agenda.

Step 5: Repeat and work through the texts.

Step 6: Interpret the results.

The following stage of this study was therefore to analyse the data gained through interviews and the secondary data collected from the websites. To assist in organising, storing and coding data, it was decided to make use of a software package (NVivo). Utilising this package, data is methodically coded and stored in a repository which can be accessed readily and analysed efficiently through the different research design stages (Walsh, 2003). Yin (1994) refers to this type of repository as a case study database which also maintains a chain of evidence to allow cases to be examined closely.

3.5.5.2   Software Tools (NVivo)

NVivo is qualitative data analysis software which assists researchers to work with data in various and effective ways. It claimed to be able to perform the following functions (Research Support, n.d.):

- Managing data sources, ideas and information derived from various sources;

- Searching data to locate word, text and passages of interest;

- Recording developing ideas and understanding data in memos and models;

- Querying the data, and coding based on the data, to explore patterns or test emerging ideas;

- Linking qualitative with quantitative data.

For this study, NVivo (Version 7) was used mainly for data coding, cross searching and findings analysis. There are two options of data codification: manual coding or auto coding and each has its advantages and disadvantages.

In manual analysis, the researcher uses the software as a storage and retrieval system. Codification of data is done manually by reading the text line by line while attempting to explain the incident. The system is set up with a "logical consistency" to support the researcher's objectives in regard to how the important and relevant data is extracted (Welsh, 2002). The advantages of this type of codification are that researchers can become familiar with the data and interpret it during the coding process. The disadvantages are that it is time consuming and there is potential for human coding errors.

Alternatively, the researcher can choose auto coding by entering the keyword (or attribute) in the search field and let the system codify the data. The advantage of this method is that it is fast and more coding can take place than under the manual method. However, the additional coding may not contribute much to an understanding of the data (Welsh, 2002). Furthermore, the researcher is more remote from the data.

Since the data sets of this study are relatively small (four cases), a manual method was chosen to codify the data. However, the auto coding was also subsequently employed to achieve the best coding results and to minimise human error. Coding stripes, viewed in the margins of documents to locate which codes were used and where, acted as an audit trail of the overall data analysis process. In following section, the codification process for this study is explained.

3.5.5.3   Data Codification Process

Manual coding

A new NVivo database was opened for each of the four case studies. Each interview transcript together with the textual sources (such as the organisations' websites and documents retrieved as text files) were loaded into NVivo and stored in a case database. Search and retrieval of data can be carried out across the data sets in a single storage system.

The coding followed a parent-child approach; therefore nodes were created and interrelated to others nodes which were organised in a hierarchy of nodes ("tree nodes"). A set of empty "tree nodes" mirroring the main four dimensions, namely Structures, People, Processes and IT Decision Domains, was created, resulting in sub-dimensions being organised under the parents as child-nodes. Data was coded by word, sentence (or partial sentence) and paragraph (or partial paragraph). Any data that covered some aspects of the dimensions of the theoretical framework was coded with "tree nodes" within the NVivo database.

If data could not be categorised under the sub-dimension, but was still relevant to the main dimension, a new node was created under the main dimension. However, any newly identified ideas, themes or dimensions that were standalone topics and could not fit in the hierarchies were codified as new "free nodes" (for example, the context of the organisation). Figure 3.4 is an illustration of the tree nodes and their child-nodes in NVivo. It shows the number of sources and number of codes in parent nodes and child nodes.
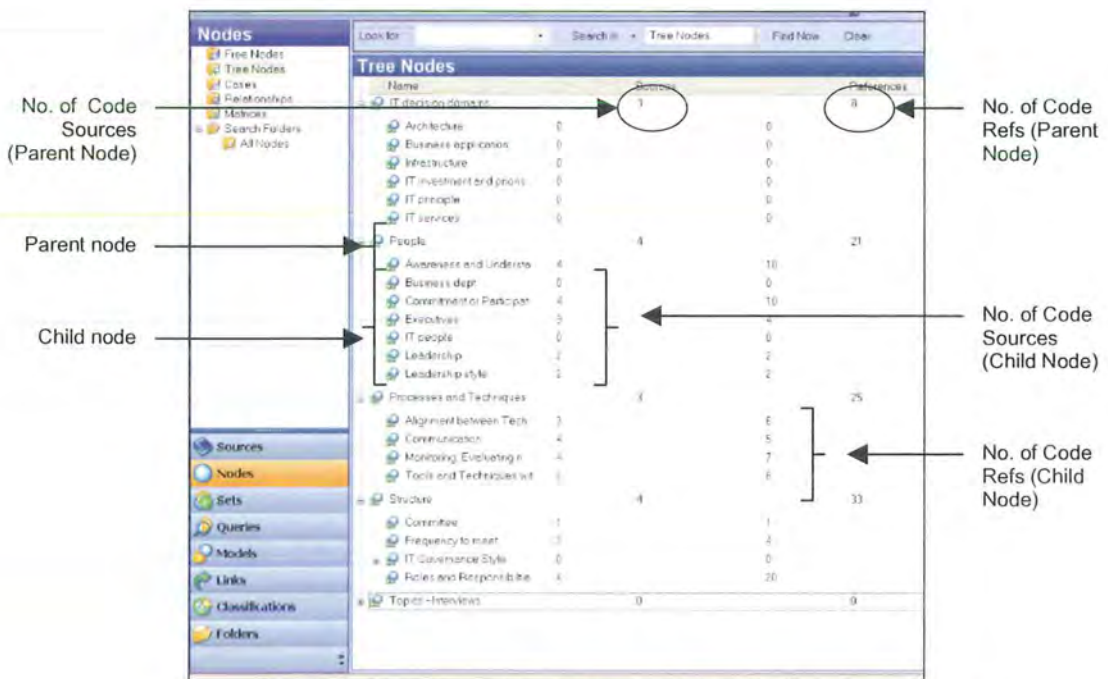
Figure 3.4: Tree Nodes of Interviews in NVivo

Auto coding

As noted previously, the manual codification process can be subject to human error. To improve the validity of the results, a text search, using multiple synonyms as keywords, was undertaken. However, the existence of multiple synonyms may lead to retrieval of partial information since the participant's ideas could be expressed in different ways. Therefore, the codes generated from this coding process were first coded under "free nodes" to allow the researcher to analyse them before categorising them as 'tree nodes". Since the process is difficult to reverse under the NVivo procedures once the action is completed, for that reason, greater reliance was placed on manual coding.

Aggregating data

After the first round of the coding exercise, some new themes or ideas emerged. Each node, including the free nodes, was reviewed and coded again with only the thematic codes applied. If the potential new themes covered similar ideas to an existing theme or the irrelevant passages could be deleted from the nodes, they would be merged. On the other hand, if not enough relevant passages were coded, the coding was spread to include more meanings.

3.5.5.4   Case Analysis

Since this research drew upon multiple case studies, the data was analysed in two phases. The first phase involved single case analysis while the second phase comprised the cross-case analysis of all four organisations. For the single case analysis, as discussed in Chapter 4, the research dimensions were examined for each of the four cases.

During the cross-case analysis (see Chapter 5), all organisations were compared with each other for their similarities and differences; and mapped against the theoretical framework to identify the gap between theory and practice (the actual IT governance). Filtotchev et al. (2007, p. 112) classified gaps into content gaps ("areas where drivers are not adequately covered") and effectiveness gaps (disparity "between the aim and actual

outcome"). In respect to effectiveness gaps, the implementation aspects were explored, for example the processes, mechanisms, the degree to which evidence exists supporting its effectiveness or ineffectiveness. Other aspects such as contingencies, complementarities, and costs were also required to be examined.

3.6   Research Quality

3.6.1   Quality Assurance

Quality has long been an issue for IS researchers (Chau, 1999). The issues associated with qualitative research are the concepts of Reliability and Validity. As Silverman (1998) observed, the problem underlying qualitative social research is the lack of consensus on the guidelines of how to carry out qualitative research. The shared element within qualitative research is the form of data gathered which are statements and words. Methods for analysing these data do not normally involve quantification or statistics. Therefore, it is up to the experience and capability of the researcher to undertake the research which can invite criticism that data analysis are carried out in a non-systematic and non-transparent manner. To ensure the research quality of this study, multiple forms of reliability and validity methods were employed.

3.6.2   Reliability and Validity

Neuman (2000) referred to reliability as the dependability or consistency of the measurable variables. This requires a reliable instrument which would produce the same or similar results when applied repeatedly. For this study, a case study instrument and interview protocol were developed which was peer reviewed (as discussed in Section 3.5.3.4). In addition, the interview questions asked are more or less verbatim so that the external validity was improved by the use of a multi-case study. Furthermore, a case study database was created and data was organised and stored in a logical and meaningful way and subjected to a systematic data analysis using the NVivo software.

One of the main criticisms of qualitative research design is external validity particularly the generalisable ability, since results are drawn from a limited number of cases. Generalisation is not justified in qualitative research and it therefore not the purpose of this research. However, to improve the external validity of this study, a careful selection of case samples based on certain criteria was conducted (as discussed in Section 3.5.2).

Construct validity was achieved when the interview questions themselves were reviewed with two academic staff who had expert knowledge in IT governance. The constructs used in this study are derived from the literature review to achieve further construct validity.

3.6.3 *Triangulation*

Triangulation emphasises the use of various complementary methods to verify results. Researchers such as Yin (1994) and Miles & Huberman (1994) recommend that as a mechanism to increase reliability and validity especially when the data collected are qualitative in nature. Data from multiple sources is analysed inductively or deductively to achieve the convergence on a given set of facts, thereby promoting confidence in the results.

For this study, the interviews conducted with the participants were triangulated against relevant literature and secondary data such as the participants' websites (refer to Table 3.5 for the list of documents collected for this study). These three elements, shown in Figure 3.5, overlap to build a chain of evidence (Yin, 1994). The purpose is to compare, verify, confirm, contrast and explain the interviews against other sources of data. A literature review might introduce so called "theoretical bias" but the various data source allowed the information about IT governance practice to be juxtapositioned against the literature.
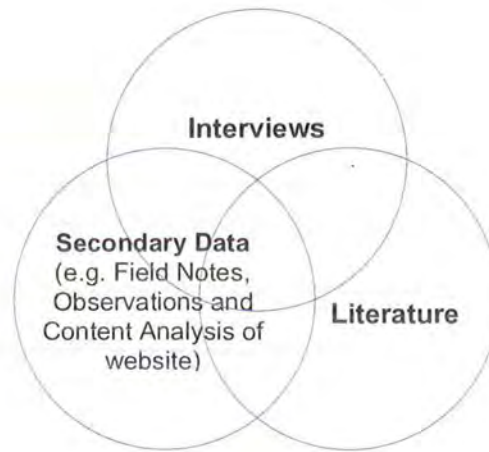
**Figure 3.5: Triangulation between Interviews,
Secondary Data and Literature**

3.6.4   *Using Software Nvivo*

Owing to the lack of guidance on how data should be analysed in qualitative data analysis, the process has been referred to as "impression analysis" (Welsh, 2002). However, one of the major advantages of using qualitative data analysis software is to improve the data analysis process. As Richards & Richards (1994) point out, the use of specialist software tools is critical in adding rigour to qualitative research. The use of NVivo in this study is discussed in Section 3.5.5.2.

3.6.5   *Ethics Clearance for Conducting Research*

The Australia National Health and Medical Research Council (NHMRC) developed the Australian Code for the Responsible Conduct of Research. This is a guide for institutions and researchers which seek to ensure responsible research conduct in Australia. At the core of this code is the requirement to maintain high ethical standards, validity and accuracy in collecting and reporting data.

As set out in Section 1.8 of the Code (NHMRC, 2007, p. 1.5), "researchers must comply with ethical principles of integrity, respect for persons, justice and beneficence". Vallance (2005) elaborated on this principle as avoiding any possible harm to research participants, having respect other people's

privacy and values, and also to maintain fairness, equity and balance of bias for both participants and the researchers.

For this study, an Ethical Clearance application was submitted and approved by the University's Committee for the Conduct of Ethical Research. The application included the following components:

- the research proposal;
- the interview questions;
- a covering letter to participants outlining the aim and scope of the research;
- Informed Consent Form for participants.

This ensured that the researcher understood and adhered to the ethics requirements of the University and protected the research participants by applying the above principles such as confidentiality, privacy and anonymity. It also gave them the ability to withdraw from interviews if they felt uncomfortable about it. The submission of Ethical Clearance Application further ensures that the language used is not vague and the interview questions focus on the research objectives. As concluded by Vallance (2005), research ethics can act as the fundamental basis of research validity promoting more transparent research activities based on ethical foundations.

3.7   Chapter Summary

This chapter provides arguments on the research method used in this study particularly in relation to the research problem and the philosophical foundations of the researcher. Different qualitative methodologies including action research, ethnographic research, grounded theory and case study methodology were reviewed and the justification of employing case study research was provided.

Data was collected mainly through the semi-structured interviews with the IT Directors / CIOs of four chosen organisations which have a level of experience in the application of IT governance. NVivo qualitative research software was used as the main data analytical tool to interpret the data. To ensure the reliability and validity of the study, a number of recognised research techniques were applied. The next chapter of this study provides a detailed analysis of data collected and the presentation of the results from the case studies analyses.

CHAPTER 4 – FINDINGS

4.1   Introduction

This chapter provides an examination and analysis of the data obtained from the interviews with the Information Technology (IT) Directors or Chief Information Officers (CIOs) of the four chosen organisations and the secondary data collected from their websites.   Each organisation is analysed as an individual case.   The analysis starts with a brief discussion of its background covering the organisational context and the initiation of IT governance within the organisation.   It then explores and describes the organisational use of IT governance to achieve a specific goal: risk management or value delivery (see Table 4.1).   The focus of analysis is on "what" and "how" each organisation adopted its IT governance.   Cross-case analysis mapping against theory (developed in Chapter 2) and the discussion of the findings related to "why" organisations conducted IT governance in a particular way are presented in Chapter 5.   For reasons of confidentiality, the actual names of all case organisations are not identified and the sources of secondary data are not referenced.

Table 4.1 Within Case and Cross Case Analysis

Organisation used in this research	Goal of IT governance (Within Case Analysis)	Cross Case Comparison
Case organisation A	Risk management	Cross case comparison between four organisations (in Chapter 5)
Case organisation B	Risk management	
Case organisation C	Value delivery	
Case organisation D	Value delivery	

4.2 Case Descriptions and Findings

4.2.1 Case Organisation A

4.2.1.1 Context

Case A is an educational institution based in Australia with a history dating back to the early 1900s. Today, it has more than 1,800 academic and administrative staff and over 21,000 students. The primary goals of the organisation are to:

- improve collaboration with community and business;
- build robust and reliable systems to support research and learning;
- build a sustainable future;
- improve the sustainable financial performance of the organisation.

A new strategic plan "Towards 2020" was developed covering four strategic priority areas. It covers:

- engaging and serving the communities;
- providing a supportive and stimulating learning community;
- developing research focus, depth and impact;
- building organisational sustainability.

Currently, the organisation uses a number of Faculty/Service Centre Operational Plans to align with the education institution's overall strategic plan. There are four academic faculties subdivided into several schools, service centres and departments, as well as a number of support areas such as central IT services, finance, and student and staff services. In approaching risk management, the organisation regards it as an important part of a good management practice. Thus, a risk management division was established and an integrated approach applied to better understand the risks posed to the organisation. It is intended to provide a foundation for informed decision-making and to minimise the impact of any unforeseen events.

4.2.1.2 Initiation of IT Governance

In the late 1990s, a major and extensive review of the organisation was conducted by an external consulting firm. The objectives of the review were to investigate the amount of money spent on support staff relative to academic activities and the structure of support areas. In relation to IT, a number of key issues were identified.

First, the review found that the structure of the IT organisation was disconnected. Although there was a central IT organisation known as "virtual campus", providing a legacy in-house built online teaching and learning environment, there was no formal and centralised governance. Nor was there any control over the administration of the applications apart from a small networking unit. Faculties ran their own IT and handled their desktops without adequate consultation with the IT department. The IT systems were working non-collectively and incohesively and there was a lack of project outcomes in the IT department.

The review revealed that no formalised strategic plan was in place to lead the entire organisation and this was particularly evident in regard to information strategy. In addition, the information strategy was prepared with inadequate consultation and lacked formal centralised collaboration.

Based on the review, one of the consultants' recommendations was to bring all these disassembled systems back together with the exception of a few schools which had high-end needs to operate their own IT. Subsequently, IT governance was implemented across the organisation addressing the following three main objectives:

- to ensure that information and business needs were met;
- to ensure that money was well-spent and the objectives of efficiency and sustainable finance were met;
- to ensure that major risks that the organisation faced were minimised.

In the next four sections, the "what" and "how" of IT governance adopted in the organisation are described under the headings of structures, people, processes and IT decision domains.

4.2.1.3 Findings

Structures

IT Organisational Structure

Figure 4.1 illustrates the arrangement of IT within an extracted part of the organisational structure relevant to this study. At present, about 76 staff are working in the central IT department which consists of three main areas: IT Support Services (around 38 staff); IT Infrastructure (around 18 staff); and Information Delivery Systems (around 13 staff). In addition to these three main areas, there is an Information Security unit which is responsible for safeguarding the information assets against technological risks facing the organisation.
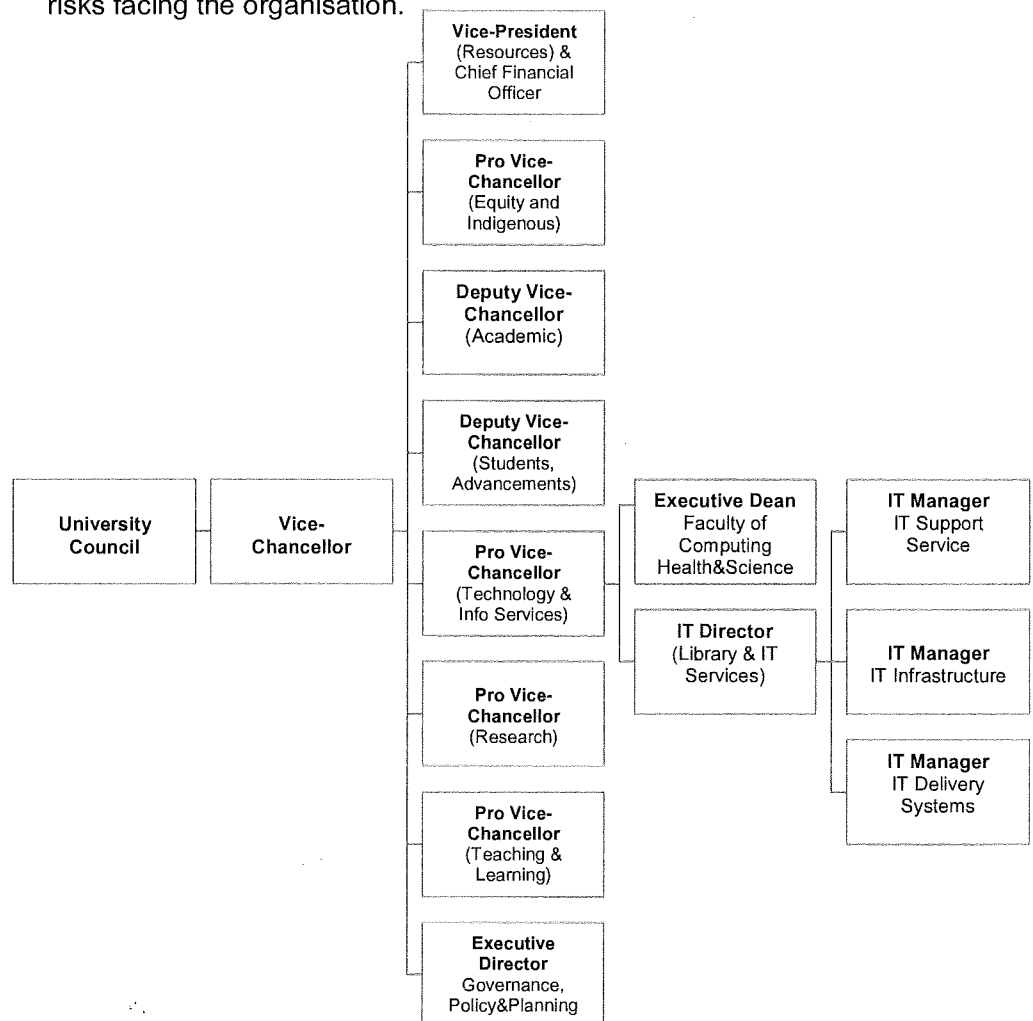
Figure 4.1 Extracted Part of Organisational Structure (Case A)   91

The IT department runs in a heavily centralised mode covering 84% of IT support for the entire organisation (including library facilities) while the remaining 16%, including the Computing, Engineering and Multimedia schools, run their own IT due to their highly differentiated computing needs. However, there are organisation-wide polices and procedures employed to integrate overall IT requirements so that risks of inconsistency and incompatibility can be mitigated and minimised.

IT Governance Design

There are various structures and different mixes of stakeholders involved in corporate governance. The two key committees relevant to IT governance are the Strategic Information Management Steering Committee (SIMSC) and the Information Technology Standards Committee (ITSC).

The SIMSC committee meets quarterly to discuss IT strategy. This is to ensure that IT is aligned with the organisation's broader strategic goals. The terms of reference of this committee include:

- reviewing IT project priorities;
- endorsing IT standards as proposed by ITSC;
- monitoring major IT developments and providing direction when needed;
- commissioning post-implementation reviews;
- proposing measures to ensure IT developments and business benefits are realised.

At present, the membership of SIMSC includes five out of seven senior executives of the organisation while the IT Director and the three IT Managers act as the observers during committee meetings. The role of SIMSC is to report and advise the Planning and Management Committee (PMC) which in turns advises the Vice Chancellor.

While SIMSC works at a strategic level, ITSC works between strategic and operational levels. The ITSC seeks to ensure that IT systems are developed and operated in accordance with the organisation's agreed

standards.   Committee members meet monthly and make recommendations to SIMSC regarding the alignment of IT with the goals of the organisation, monitoring of the activities within faculty/business areas and providing guidance on IT as required. Current membership includes faculty representatives, general staff, student representatives, experts and advisors and observers from the IT department.

Besides SIMSC and ITSC, there are other functional groups such as the Change Management Group, Internal Audit, Audit Assurance and Risk Management which support the functions of IT governance.

Decision-Making Behaviour

Decision-making behaviour is concerned with "who has input" and "who makes decision". At present, IT decisions involve stakeholders such as executives, managerial staff and the directors of related areas. However, their roles are focused more on the inputs which include advice and making recommendations. The IT decision-making rests with the IT Director and the Pro-Vice Chancellor of Technology and Information Services (PVC-TIS) following their consultation with the relevant stakeholders. They are also the two most senior accountable officers for IT governance within the organisation.

People

Leadership

The leadership of the organisation is cost-driven with an emphasis on risk management. Their IT orientation is about efficiency, effectiveness and flexibility. Currently, around 5-6% of the annual revenue is spent on IT. Even though the IT Director perceived IT as core business (part of the teaching and learning services of the organisation), top management perceived it as "an overhead and support service". The study showed that while the organisation has some extent of strategic and tactical dialogue in relation to the use of IT to maximise the benefits, it is still very ad hoc. The focus remains mostly operation-oriented.

Roles and Responsibilities

The IT Director, in charge of managing and administering the library and the IT Department, reports to the PVC-TIS. In regard to IT governance, the IT Director is responsible for developing the broad architectural direction of the infrastructure and the preparation of the strategic information plan every two years. He is also in-charge of making sure that plans developed are delivered and financial resources are provided annually. On the other hand, the PVC-TIS is in charge of setting and developing a higher level of strategy for IT. As described by the IT Director, IT governance is "a day-to-day, minute-to-minute activity and every decision made day-to-day is about [information] governance."

IT governance is positioned within the broader scope of corporate governance. The organisation has developed a Code of Conduct addressing the authority, functions and duties, powers and responsibilities of Council, Chancellor and the Vice Chancellors. Its Corporate Governance Statement (CGS) delineates the responsibilities of Council, outlines the committee structures and uses terms of reference to assist the committees in meeting their responsibilities.

As noted by the IT Director, one of the biggest IT risks the organisation faces is human error (in the data centre). Interestingly, although there were around 66 IT policies, procedures and standards posted onto the company website, the IT Director commented that they had to revise and simplify some of them as they were criticised as too complex and difficult to follow.

Commitment and Participation

There are ongoing efforts to review and reflect on the governance process. The Council holds workshops with the executive management regularly to discuss governance and strategy within the organisation.

In relation to the involvement of PVC-TIS, the IT Director describes him as "very hands-on in terms of IT" and "very involved". The IT Director suggested that "IT governance is a day-to-day, minute-to-minute job". This, to some extent, reflects the fact that IT governance has been ingrained as a

primary responsibility rather than treating it as a secondary task. Most important of all, it demonstrates the organisation's commitment to, and participation in, IT governance.

Awareness and Understanding of IT Governance

The IT Director defined IT governance as "managing the service outcomes and business outcomes of the information in the organisation... which includes governing information of the business of the education institution, and to ensure that information has been provided and meets the requirements of customers. Behind that, there are technical things to make it work." The interview showed that a technical and control perspective of IT governance was held by the IT Director.

IT Governance Processes

Tools and Techniques

The organisation mainly utilised external frameworks which have been adapted for the organisation. For example, the Information Technology Infrastructure Library (ITIL®), following the recommendation of an external consultant, was used as the standards for service management. ITIL® covers ten main areas (see Section 2.5.3 of Chapter 2), and presently the organisation has implemented several components such as Service Desk, Incidence of Login, and Incidence of Responses and Procedures. However, the reporting side of these areas are not yet mature. The current ITIL® focuses are on Change Management and Configuration Management but they are still not fully developed. Besides ITIL®, the organisation is planning to formally adopt the COBIT framework (Control Objectives for Information and related Technology) even though there is already a similar internal developed framework operating.

Human errors, noted earlier, are perceived as big threats to the organisation. The use of ITIL® and COBIT can improve the quality of IT service management and allow the organisation to have more control over IT so that risks can be mitigated and minimised. Besides human error, security risks are another major IT risk facing the organisation. The current security risks in the organisation include breach of access security, poorly

performing systems, under-resourced systems and unreliable hardware and infrastructure. As indicated by the IT Director, the organisation uses different strategies to mitigate and minimise such risks. One of them is the resilience framework designed to measure how flexible the organisation is against risks such as human resources, hardware resources, software resources and supplied service (e.g. air conditioning, power, physical security and maintenance contracts). A resilience study has been implemented successfully for the past five years to keep the organisation's IT infrastructure and network running and reliable.

The APT Methodology is a Project Management Methodology that has been adopted by the organisation to support IT governance. Though it is not an IT governance framework, the IT Director viewed it as important support to achieve effective risk management through IT governance. As he explained, "it is very useful to define and clarify the requirements and expectations...if the project is not able to be delivered, it means that the money, the outcomes and the delivery of the service are not governed". If the IT project cannot deliver, it is implicitly a risk to the organisation.

Alignment Process

The organisation has an overall strategic plan and under that plan are a number of faculty/service centre operation plans. The IT Director is responsible for putting all the IT plans together as a strategic IT plan and resourcing the plan. The strategic IT plan is then reviewed and prioritised for the forthcoming year. There are also quarterly strategic priorities and directives to be reviewed within the organisation. Sub-groups of stakeholders are formed to rank and prioritise the resources required. Overall, IT needs are driven by the business needs and business cycles of the organisation. Though the study showed that there is an indication of alignment between IT governance and the corporate governance of the organisation, such an alignment is mostly top down rather than bilaterally directed.

Communication Process

Communication is mainly carried out through formal channels. For example, SIMSC meet quarterly and ITSC meet monthly to improve the communications and discuss strategic and tactical issues. Organisation-wide policies, standards and procedures are posted onto the organisation website for staff reference and compliance purposes. The organisation is also exploring the possibility of implementing Service Architecture and Enterprise Architecture to improve communication.

Performance Tracking Process

The IT Director indicated that the performance-tracking process is an area where considerable work is required. There are two main issues: tracking inputs versus outputs and establishing a shared view on what to measure.

Currently, the IT department monitors resource "inputs" such as financial dollars per student and financial dollars per network device, per server and per IT employee. A customer satisfaction survey in terms of the student level and staff level satisfaction is also conducted annually. However, the IT Director felt that tracking "output" was difficult as a result of the inadequacy of benchmarking in the sector as well as the IT staffs' struggle to produce performance reports owing to the complex nature of IT.

There was no common agreement between the audit department and the IT department with respect to what appropriate performance metrics and measurements should be used. For example, the IT department used benchmarking and some components of ITIL® to measure performance, while its audit department used the measurement of COBIT to evaluate IT performance.

IT Decision Domains

Although the study showed that the organisation divided its IT decisions into various IT domains such as IT principles, and IT investment and prioritisation, the main issue is that they do not make these domains explicit. As the IT Director suggested, IT decisions are mainly driven by the

business and financial needs of the organisation and occasionally by how decisions are made and the type of decisions. The decision-making process works within the business cycle framework, that is the annual plan, where decisions are financial- and resources-driven. As an example, all IT projects must be supported by business cases which are submitted to SIMSC for funding approval before any Project Execution Plans are developed. But as noted by the IT Director, the scarcity of the IT resources might mean the IT department gets diverted to address other unplanned needs or remedial incidents. In the context where the organisation's leadership is cost-oriented and the alignment process is unidirectional (a top down approach), the IT governance decision-making process could become ad hoc and reactive to the operational matters rather than taking a balanced and proactive approach which explores the strategic and operational benefits of IT.

4.2.2 Case Organisation B

4.2.2.1 Context

Case B is a education institution established in early 1900s. It has around 3,500 academic and administrative staff members, and around 20,000 students. It is a traditional university with a strong research focus. An organisational long-term objective is to become one of the top 50 international universities within 50 years. There are nine academic faculties that are subdivided into a number of schools and support areas. With respect to risk management, the organisation has developed a corporate risk management framework guiding the whole of the organisation's operation. There is also a risk registrar set up for every part of the business.

4.2.2.2 Initiation of IT Governance

IT governance was initiated by the IT Director around two years ago. As noted by the IT Director, there was a governance structure in place previously but it was not working effectively or efficiently. The main issues

identified in relation to IT governance was that it failed to provide any mechanism for prioritising projects, there was no alignment between IT governance and the business side of the organisation, and there was no clear-cut mechanism in relation to who was responsible for what. As a result, IT governance was re-initiated with the hope that a clearly mandated mechanism and reporting line could be incorporated to improve organisational performance. Subsequently, IT governance was commenced with the following four objectives:

- Establish a clear line of reporting and a clear line for implementation;
- Get approval and implement once the plans are in place;
- Align with organisational goals;
- Establish formal communication to get agreement.

In the next four sections, the "what" and "how" of IT governance adopted in the organisation are described.

4.2.2.3   Findings

Structures

IT Organisational Structure

The present IT organisational structure represents a devolved and decentralised mode within the organisation. It employs around 70 staff working in the central IT department. But the IT Director estimates there are a further 70 to 80 IT staff, working across the faculties and business units. They do not report to the central IT department, instead they report directly to their respective faculty directors or business units. Figure 4.2 sets out the arrangement of IT within an extracted part of organisational structure relevant to this study.
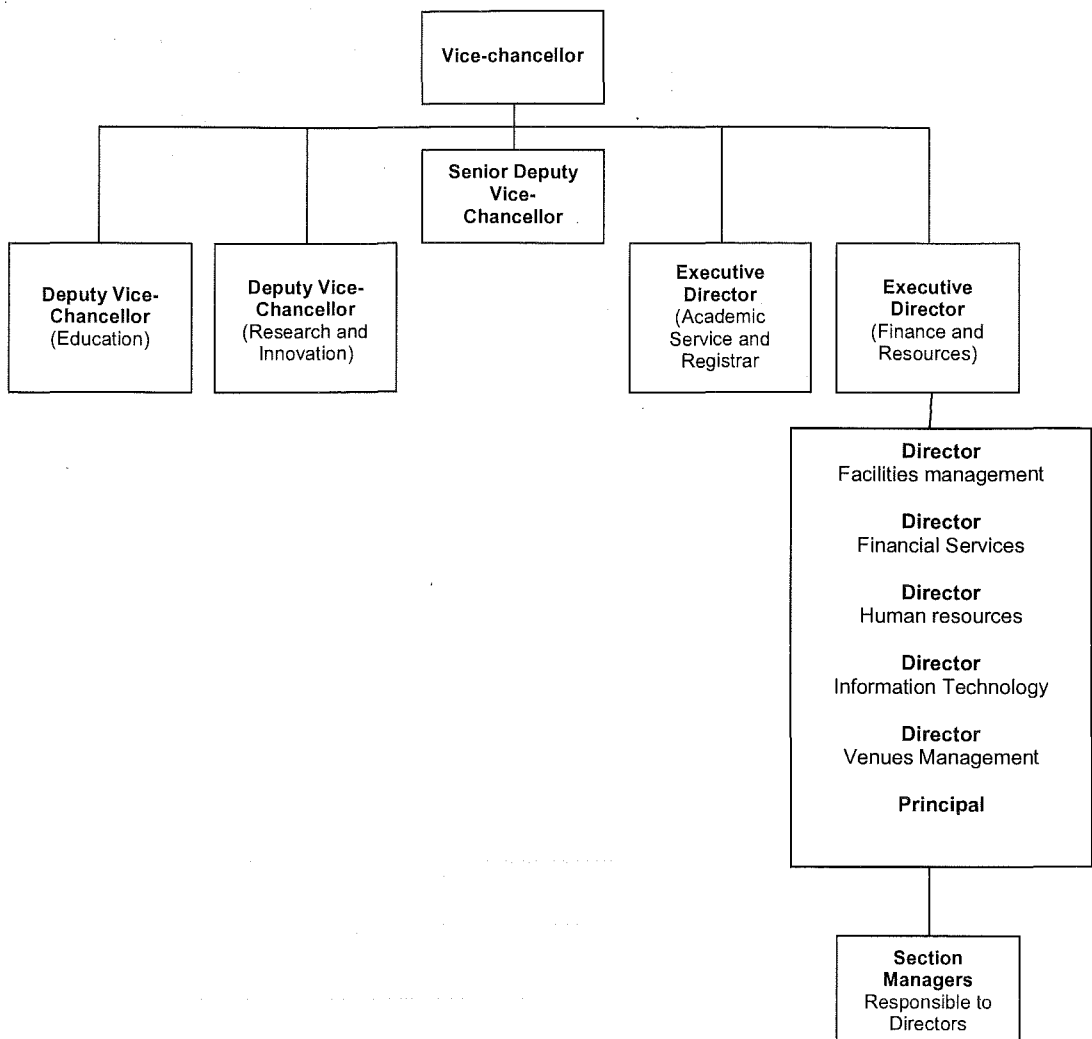
Figure 4.2: Extracted Part of Organisational Structure (Case B)

As the IT Director suggested, running IT in such a decentralised mode is in fact a high risk. Firstly, the central IT department does not know how IT is operated within faculties or business units; thus there is a lack of transparency and inconsistency across operations. Secondly, the department does not have any control over IT in faculties and business units particularly in the event that IT risks are found which threaten the organisation. Thirdly, there are grey areas in relation to who is responsible for what. One of the IT Director's main tasks was to bring together the scattered IT systems and services but, before that, defining the role of central IT is the priority - which IT resides centrally and which IT resides

departmentally. As the IT Director explained, "to work out that definition at a strategic level and how that will work is part of the challenge for us".

IT Governance Design

According to the organisation's Strategic Plan for Information Technology & Information Systems, there are various committees which are responsible for various types of decision-making. As an example, the Information Services Committee is responsible for establishing and maintaining the integrated development of IT services, advising on the IT strategy implementation and maintaining the IT-related policy framework. The Information Technology Technical Advisory Group is a sub-group of Information Services Committee responsible for identifying policy issues and providing technical advice to the Information Services Committee.

On the surface, while it appears that committees are set up with clear and unambiguous roles and responsibilities, as the IT Director noted, there is a disparity between what was planned and what was achieved. He explained that "the committee is just a big committee with no decisions made...there is no real structure to support IT governance". Therefore, the organisation is still working through a governance model to guide the whole organisation.

Decision-Making Behaviour

Decision-making behaviour is concerned with who has input and who makes decision. According to the IT Director, he is a "participant" in the IT governance and he can "provide information so that IT decisions can be made". The study showed the role that the IT Director took on was a reactive and ad hoc one. In addition, the meetings were compromised by the size of the committee making decisions difficult to achieve.

People

Leadership

The leadership of the organisation is cost-driven and the IT orientation is about efficiency and effectiveness. As perceived by the top management,

"IT is seen as a cost, and has been seen as a very low level tactical thing". Currently, less than 2% of the organisation's expenditure is spent on central IT. As the IT Director does not have control over IT outside the central IT department, he did not know the size of IT expenditures in other faculties and business units but estimated that it could be around 3% to 3.5% of organisational expenditure. The leadership in IT governance in this respect appears reactive and ad hoc.

Roles and Responsibilities

Reporting to the Executive Director of Finance and Resources, the main responsibility of the IT Director is to manage the central IT across the whole organisation. The main services that the central IT department provide are back-end support services such as firewall security, data centre operations, and back-end IT support for most of the common services across the campus. However, the IT Director emphasised that he is only responsible for the activities happening within the central IT department; he does not have any control over how IT is managed outside the central IT department. For example, if he or his colleagues in the central IT department discover any IT threats inside the faculties, they can only raise such issues with the faculties; they have no control over any action taken to mitigate or minimise the risk. Another example is that, if the faculties outsource their internal IT service to an external party, they are not required to consult central IT.

This shows that the roles and responsibilities are not clearly defined and there are grey areas between central IT and the IT within the facilities and business units. There also seems to be a lack of communication and collaboration between the central IT department and the other facilities and business units.

Commitment and Participation

Although the IT Director appeared to have commitment to IT governance, it seems that there is inadequate support or participation from senior management. As a result, the adoption of IT governance is still very limited

since its initiation two years ago. IT risk management is predominately undertaken by the central IT department and the IT Director. There is a risk register in place where the central IT department identifies IT risks and attempts to manage them. Internal IT audits and external audits are carried out but tend to focus on the financial side of the system. The audit and risk management initiatives appear mechanistic and static and take place at a superficial level. As commented by the IT Director, "they do not really audit IT". This is indicative of the lack of co-ordination between audit and the central IT department and the apparent inadequate strategic focus and commitment from senior management in this respect.

Awareness and Understanding of IT Governance

The IT Director described IT governance as "the mandate that comes from what you are trying to do...[it] is a clear cut mandate for who does what and coordinate them in getting agreement toward it." On the other hand, he added that the current IT governance is implemented under the broad auspices of the Vice Chancellor who used industry standard like COBIT as the foundation though it has not been adopted within the organisation yet. The interview with the IT Director showed that the technical, control and authority perspectives of IT governance was shared across the organisation.

IT Governance Processes

Tools and Techniques

The use of IT governance to achieve risk management is still very elementary and limited in the organisation. Currently, a risk registrar is used and a review is undertaken yearly to evaluate the IT risk profile and performance. ITIL® was introduced in 2006 to improve the IT service quality and reduce the long-term service provision costs. As the IT Director indicated, the organisation is still working on a overall governance model to guide the IT processes and mechanisms; however it is still limited and ad hoc.

Alignment Process

As the organisation has an overall strategic plan and various operating plans in place, an important requirement of IT governance is to align with the broader organisation goals. However, the study showed that the linkage between the two are weak or non-existent due to the lack of strategic perspective on IT. For instance, the needs of IT are driven by the business needs and business cycles of the organisation and prioritised every year in terms of their importance and resource requirements. However, the lack of consideration of an IT strategy resulted in IT priorities often being effectively overwritten by the requests of faculties or business units without a proper and formalised consultation about impacts on IT strategy.

Communication Process

Communication takes place mainly through committees and meetings; which constitute the formal communication channel. Due to the fact that IT governance remains in very basic form in the organisation, the view held by senior management in relation to IT remains tactical. Thus IT risks are managed as operational risks or IT project risks and communications remain at an operational level. There is a lack of strategic discussion between senior management and the IT Director to consider IT and its risks from a strategic point of view.

Performance Tracking Process

As IT governance remains basic in the organisation and there is minimal effective formal mechanisms to identify risks, there is no formal process to monitor them and thus performance tracking process is weak or non-existent. The only relevant process in relation to monitoring of risk is the IT audits carried out internally and externally. When the external auditors undertake the financial audit for the organisation every year, IT risks are also audited briefly and mainly from a system and financial perspective. IT risks are neither formally nor extensively examined.

IT Decision Domains

There is no IT decision domain existing within the organisation. IT decisions are ad-hoc and reactive. As the IT Director suggested, "it is just seen as a big bucket. Every time there is a new project, it is thrown into the bucket". There is no mechanism in place to manage projects nor is there an IT strategy to guide and support the various strategic and operational focuses of IT (i.e. IT principles, IT infrastructure strategies, IT architecture, business application needs, IT investment and prioritisation). IT projects can be replaced easily by another project or the budget / funding is stretched in order to cover another project without formal consultation or understanding of the implication of such decisions.

4.2.3   Case Organisation C

4.2.3.1   Context

Case C is a large tertiary educational institution established in the 1960s. It has over 6,000 academic and administrative staff members and over 40,000 students. The vision of the organisation is to become a leading teaching and research institution within the region. Currently, the organisation has an overall strategic plan, translated into several operational plans, and a number of enabling plans that are used to align with the organisational strategic goals. The organisation divides into several operational units including divisions, schools, centres, institutes and administrative support areas.

4.2.3.2   Initiation of IT Governance

IT governance was first introduced to the organisation following an external review in the late 1990s. During the review, a number of major issues relating to IT were identified. They included:

- The influence of the different IT directions (from the faculties and business units) on overall organisational effectiveness and efficiency;
- The inadequacy of resources spent on IT;
- The lack of strategic planning and management in IT across the organisation;
- The lack of leadership in executive management.

IT governance, addressing these issues, was subsequently implemented with some success. Most importantly, the success of IT governance raised senior management's understanding and awareness of IT governance and the benefits it brought to the organisation. In addition, confidence in, and commitment to, IT governance was reinforced.

Following the departure of the former IT Director, a new CIO was appointed at the end of 2004. While IT governance was an ongoing initiative to improve organisational performance, the new CIO recognised that an overall IT governance framework, integrating all the core components of IT, was lacking in order to align IT with organisational goals and objectives. IT governance was re-initiated as a project in early 2007 with the following three main objectives:

- to ensure that risks are being effectively managed with regard to IT;
- to ensure that IT is closely aligned to the business needs within the organisation;
- to ensure that IT delivers value to the organisation.

With regard to IT values, the organisation has an increasing focus to ensure that IT values are delivered. For example, the organisation created a position of Director of Client Services in 2007 with an explicit focus on looking after its customers to improve the client experience. Also, the emphasis on clients is intended to shift from an inward perspective to both inward and outward perspectives; these are explained in the next section.

4.2.3.3 Findings

Structures

IT Organisational Structure

The organisation presently has around 260 IT staff working in the central IT department and the IT areas across faculties and business units. The IT organisational structure represents a federal mode. Headed by a Chief Information Officer (CIO), the central IT department is divided into three sections: Infrastructure, Business Systems and Client Services. Central IT provides support across the whole organisation and the IT managers stationed within the faculties and business units are in charge of fulfilling their IT needs. All IT managers report back to the CIO. Figure 4.3 illustrates the arrangement of IT within an excerpt of the organisational structure relevant to this study.
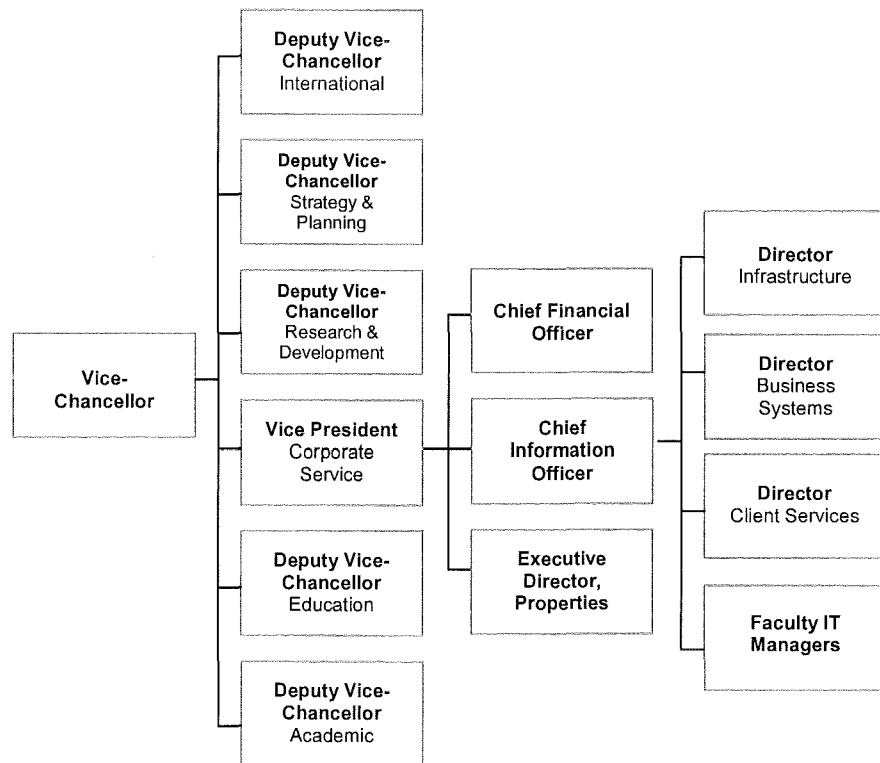
Figure 4.3 Extracted part of Organisational Structure (Case C)

The organisation recognises that tighter control over IT is required; thus ongoing reviews are conducted to evaluate services that should be brought back to the central IT department such as the procurement of IT and the standardisation of policies and standards across the organisation.

IT Governance Design

There are various structures and different mixes of stakeholders involved in IT governance. The IT Strategic and Planning Committee reports to the Planning and Management Committee which in turn advises the Vice-Chancellor. The CIO, who is involved in the IT Strategic and Planning Committee, meets with all IT Managers on a fortnightly basis to keep each other informed in regards to the emerging issues within the IT department.

There is also a Technical Management Group targeting the technical aspect of IT such as Incidents (e.g. system failure) and examining the causes of it. The outcomes will then be reported to senior management but are not necessarily shared across the whole organisation.

Decision-Making Behaviour

As the CIO explained, stakeholders such as students, staff, IT managers and senior executives, all have inputs depending on the type of decisions being made. But ultimately, the CIO and the respective IT Managers co-jointly make decisions based on the consultation and feedback from the stakeholders. They are the accountable officers for the implementation of IT. Ultimately, however, the Deputy Vice Chancellor is the highest responsible officer for the overall IT governance.

People

Leadership

The leadership of the organisation is strategic driven by the strategic plans of the organisation. Their IT orientation is not limited to efficiency, effectiveness and flexibility but also the proactive use of IT. Currently, around 8-8.5% of the organisation's annual revenue is spent on IT, which is

around 46 million Australian dollars. This budget excludes desktops, laptops and any other expenses which are IT related but categorised under research activities. As described by the CIO, while IT is not a core business, it is an enabling technology underpinning all business processes within the organisation. This view is shared by the senior management of the organisation.

The organisational structure is reviewed from time to time to ensure that the organisation's mechanisms provide an appropriate platform to facilitate effective processes and decisions. This illustrates senior management's foresight and proactive approach in maintaining the agility of the organisation in response to the constant changing environment and the requirement to align internal transformation with such change.

Roles and Responsibilities

The CIO, responsible for all the IT within organisation, reports to the Vice President of Corporate Service (VP-CS) who in turn reports to the Vice Chancellor of the organisation. The CIO is responsible for overseeing the implementation of IT governance and to provide assurance to senior executives that IT is working in the right direction.

To ensure that IT values are delivered to clients, the primary responsibility of the Director of Client Services is to ensure that the client's experience is as good as it can be. He is in-charge of directing, monitoring and maintaining IT service quality across the organisation as well as ensuring that the service quality across all areas is aligned with client expectations. Currently, the focus of client services is more on an inward perspective. Around 50% of the internal staff within the organisation are served. The organisation is in the process of extending that focus to both inward (staff) and outward (student) perspectives.

Commitment and Participation

The organisation has a history of implementing IT governance initiated in 2000. Senior management, the faculties and business units have seen the benefits gained through IT governance, thus they are more accepting and committed to supporting IT governance. As a result, the scope of IT governance is becoming broader over time. The organisation started off using IT governance as a tool to retain control over IT (as a risk management initiative), to improve the client services internally (50% of the organisation), and then to expand the client services across the whole institution. Specifically, client service is now recognised by senior management as one of the important elements for the organisation in delivering value.

Awareness and Understanding of IT Governance

The CIO suggested that the previously implemented IT governance initiative focused on mechanisms and processes rather than on an overall IT governance framework. He defined IT governance as "an overarching set of principles, policies and procedures. It is to provide reassurance to the senior executive that risk is being effectively managed with regard to IT, IT is delivering value to the organisation, and IT is closely align with the business needs". The objectives specified match some of the five goals stated by the Information Technology Governance Institute (ITGI), namely risk management, value delivery and strategic alignment. A holistic view on IT governance was held within the organisation to ensure an effective integration of IT processes and mechanisms.

IT Governance Processes

Tools and Techniques

A number of best practice frameworks such as COBIT, ITIL®, ISO17799 have been implemented by the organisation since 2000. As described by the CIO, the organisation uses Australian Standards AS8015 (Corporate Governance of Information, Communication and Technology) as the basis for developing its overarching framework to implement IT governance. The

organisation also has a framework in place to manage progress, for example what processes tie into the standard processes, procedures, standards, responsibilities, committees, and to ensure that all of these align with the planning framework.

Alignment Process

The organisation uses a Balanced Scorecard Framework as the basis to develop a planning framework to underpin its planning and operational activities within a holistic approach. In addition, the strategic plan is underpinned by the five enabling plans (one of them is the IT enabling plan) supported by their respective operational plans. The study showed that there is linkage between the IT enabling plan and the strategic plan as well as between the IT enabling plan and the operational plans. Most importantly, there is considerable emphasis on the alignment of IT governance with corporate governance within the organisation.

There is an exception process in place in the event that special requests are received (e.g. procurement of hardware). In this instance, the requests must be driven by a business case to justify such action and the evaluation would be handled by a subgroup of the IT committee.

Communication Process

Communication is done mainly through formal channels, such as committees and meetings, as well as informal channels such as shared understanding and networking. The communication occurs at both a strategic level and a tactical level. For example, fortnightly meeting are held with IT staff to discuss incidents, problems, IT changes and licence issues. The important issues are shared with senior management and any of the relevant group. Another type of meeting is held with all IT managers on a fortnightly basis to keep each other updated on IT emerging issues within the organisation.

Besides the formal channels of communication, the CIO emphasised the use of an informal approach. He pointed out that to ensure communication is effective, before starting out on any project, one of the most important

tasks is to establish a common understanding of what needs to be achieved. This would ensure that the same "language" is shared with amongst IT staff and all the stakeholders are working toward the same direction.

Performance Tracking Process

The organisation demonstrated a strong focus on performance measurement of value delivery via IT governance. For example, a Balanced Scorecard (BSC) framework and Key Performance Indicators (KPIs) were employed to measure performance levels. For example, the use of surveys established client experiences and satisfaction with the IT services provided by the institution. However, as noted by the CIO, client experience is difficult to measure as it is hard to define the term "good". It is not a simple and straightforward concept in that it depends on the expectations and prior experiences of the respondents.

IT Decision Domains

The study showed that organisational IT decisions are driven by the business and financial needs of the organisation. Though the IT decision domains are not explicit to the CIO, he stated that there are four identified domains which are very important across the organisation; they are planning, investment, infrastructure, application and client. The domains have some resemblance to the IT decision domains identified in the literature, as IT principles, IT infrastructure strategies, IT architecture, business application needs, and IT investment and prioritisation.

4.2.4   Case Organisation D

4.2.4.1   Context

Case D has been established for more than 35 years and has around 1,500 academic and administrative staff members and around 15,000 students. The organisation is overseen by a Vice Chancellor supported by senior management (such as deputy vice chancellors), central administration (such as the human resources and financial services), and academic divisions which sub-divide into faculties and schools.

The organisation has a strong focus on value delivery. As an example, a new strategic plan was developed for the period 2007 to 2010 focusing on four themes: quality, people, engagement and commercial and financial rigour. In respect of the quality, the organisation seeks to build on its reputation for high quality teaching and excellence in research. In relation to the theme of people, the organisation recognises that valuing and developing its people is essential to the long-term success of the organisation. It understands that its success depends on its ability to attract, develop, nurture and retain high quality academic and professional staff. The organisation explicitly sought to "have all these themes embedded in everything that the institution does in order to meet the competitive challenges facing the institution". In regard to IT value delivery, the central IT department has set a vision to provide an IT experience that is "the best in class" to the students and staff of the education institution.

4.2.4.2   Initiation of IT Governance

IT Governance was initiated by the CIO following a review conducted around two and a half years ago. This review revealed the limited extent of governance in the organisation. In particular, a number of major issues were identified:

- Non-functional governance in the form of a steering committee;
- Lack of framework to support decision making;

- Inadequate communication between faculties and schools and the central IT department pertaining to the local IT development within faculties and business units.

Following this review, a governance structure was created with the purpose of bringing all the disconnected components together and arranging them under a single framework. There are four main objectives set out for the IT governance, which are to:

- make consistent decision and gain understanding from project perspective;
- make sure that decision is visible;
- make sure that directions are consistent with the plan;
- make sure concerns are addressed.

4.2.4.3   Findings

Structure

IT Organisational Structure

The IT organisational structure represents a federal model. At present, the organisation has around 71 IT staff working in both central IT department and across the whole organisation (see Figure 4.4). Headed by a CIO, the central IT department is structured into functional areas: the Directorate, Communication Services, Computer Services, Customer Services, Information Systems Services and IT Security. There is an IT service desk acting as a first point of contact for clients. Moreover, there are also IT staff stationed in the faculties and business units whose responsibilities are to provide specific IT support. The CIO reports to the Deputy Vice Chancellor (Corporate).

Apart from technical IT staff, the organisation has around 20 non-technical staff working in the business units whose jobs are IT-related to some extent; these include the web-contact administrators and business analysts. They provide supplementary IT services to business units rather than the

technical-oriented IT services such as networking which the central IT department provides. However, they do not report to the CIO, instead they report to their departmental heads.
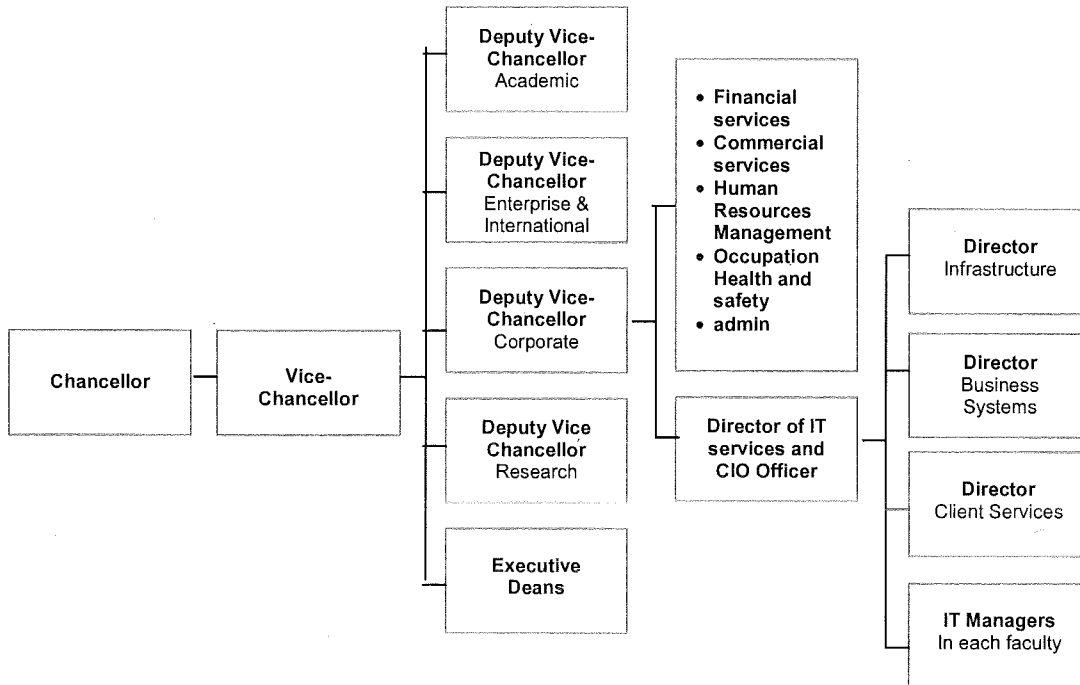
Figure 4.4 Extracted part of Organisational Structure (Case D)

IT Governance Design

In related to IT governance, the CIO has various roles and responsibilities on diffierent committees which include chairing the committee or as a participant depending on the types of decisions made. There are also various additional committees set up within the organisation. First of all, there is an IT Discovery Forum which consists of a wide range of members coming from different backgrounds. The current committee membership includes the CIO of the organisation, an external consultant in IT governance, corporate leaders and external consultants who are knowledgeable in their own fields. The committee meets twice a year to discuss the roles and capabilities of IT from various perspectives. The terms of reference of that committee are:

- Developing business improvement strategies through the use of IT – that is to examine how best to use technology to improve and enhance the quality of Education institution operations and services.

- Investigating and planning new technologies that can benefit the organisation.

- Recommending education and training in regards to new technologies.

- Providing advice to the senior management.

- Defining, setting direction and determining priorities for any further investigations.

- Communicating information in a two-way process between members.

- Supporting the decisions made by the Group.

Secondly, the organisation also set up an IT Steering Committee. The agenda of this committee is to discuss IT service delivery and IT projects that the CIO and his IT services group are managing. As the CIO explained, the organisation does not have a separate IT governance group for decision making. Instead the senior executive group of the organisation assesses IT investment decision in the same way as it makes the other decisions.

Decision-Making Behaviour

The CIO stressed that stakeholders such as students, staff, IT managers and senior executives all have input depending on the type of decision being made. However, the Deputy Vice-Chancellor (Corporate) and the CIO are the ones primarily responsible for all decisions-making following consultation with stakeholders and the recommendation made by the Technology Steering Group. Ultimately, the CIO and the Deputy Vice Chancellor (Corporate) are the accountable officers for IT governance.

People

Leadership

The leadership of the organisation is strategy oriented. Business is driven by strategic plans developed by the organisation. IT orientation is not limited to efficiency, effectiveness and flexibility but more importantly the exploitation and innovation of IT. Currently, around 6% of the

organisation's annual revenue is spent on IT. The function of IT is to support the business of the organisation, that is student education and staff research. The CIO described IT as "an enabler and innovator…we will look at what we could do with IT as it allows us to push the boundary". The study showed that the organisation has a proactive management style in relation to IT.

Roles and Responsibilities

The CIO has the overall responsibility of coordinating IT strategic planning activities for IT services and providing administrative support for the effective operation of IT. He is in charge of planning, developing and operating the central information and communications infrastructure of the organisation, as well as setting the strategic agenda for IT. As he emphasised, "some of the IT services must be centralised and are non-negotiable"; these include the back-end services and networking. This is to ensure that clear and unambiguous roles and responsibilities are established for IT staff located in central IT, faculties and business units.

The organisation has a strong focus on IT value delivery especially in terms of the client experience with the organisation. To ensure that IT values are delivered to clients, the Director of Client Services oversees client services to ensure that quality and effective IT services are provided to the organisation.

Commitment and Participation

One of the organisation's strategic focuses is on the quality of the services delivered to the staff and students within the organisation. To achieve quality service delivery and value derived from IT, the central IT department's vision is to "provide an IT experience that is the best in class, consistent, relevant, and functional to the students and staff". In addition, the organisation set up a Client Services section with the aim of serving clients and their interests. Most importantly, the IT Discovery Forum is a committee with an agenda of exploring the use of IT with a forward looking perspective, to maximize its value.

Awareness and Understanding of IT Governance

The CIO defined IT governance as "essentially a decision and communication process. It is how we get common decision-making but it is also how we communicate out and back from various stakeholders. It is about decision-making, it is about who makes decision, who is entrusted to make decision but as a whole, it is about the communication forum as well as to allow a two-way communication". The interview indicated that a strong communication and decision-making perspective was held by the CIO in regards to IT governance

IT Governance Processes

Tools and Techniques

As the CIO indicated, the governance framework was developed internally. He suggested that "there is no methodology around of these as far as I know". The organisation implemented aspects of ITIL® such as Incident Management, Problem Management and Change Management but it was addressed at a process level rather than at a governance level. These modules are not linked to the governance process. The interview indicated that the CIO did not consider that the best practice frameworks are the governance frameworks because they are too "mechanistic" in nature.

Alignment Process

All IT projects must be presented as business cases. They are then reviewed and approved by the CIO before being presented to the senior management for funding purposes. This is to ensure that the IT projects are in line with organisational goals and meet organisational criteria.

Ultimately, IT governance is linked back to the overall governance of the organisation. Currently, the organisation has an overall strategic plan in place as well as an IT strategic plan which is prepared by the IT Strategic Plan Working Group. The four themes stressed in the organisational strategic plan are quality, people, engagement, and commercial and financial rigour. The organisation places emphasis on having these themes

embedded in all the projects that the organisation undertakes. This is further strengthened by the operations of the IT Discovery Forum Committee mentioned earlier.

Communication Process

Communication takes place through both formal and informal channels. Formal processes include committees, meetings and website while the informal processes occur through face-to-face meetings and discussion.

Performance Tracking Process

The organisation uses various measurements to track projects such as cost, time and benefits. However, the CIO acknowledged, "those KPI are fairly useless because you cannot implement much on what you are going forward; they only tell you what you have done". The interview indicated that there is a misconception of performance tracking and measurement in relation to IT governance because of this backward looking perspective.

IT Decision Domains

It does not appear that organisational IT decisions are determined by the domains of IT principles, IT architecture, IT infrastructure strategies, business application needs but more narrowly by IT investment and funding prioritisation. As the CIO explained, all IT projects are driven by business cases. The senior management examines the portfolio of all projects and determines the priorities of in all cases.

4.3   Summary of Findings

In the above four sections, the "what" and "how" of IT governance adopted in each of the four case organisations was described and analysed. Table 4.2 summarises the results of the analysis of the case organisation. However, discussion of the findings and their implications to both research and practice are provided in the next chapter.

Table 4.2: Case Summary

Item	Description	Risk Management		Value Delivery	
		Case A	Case B	Case C	Case D
1	**Structure**				
1.1	IT Organisational Structure	• Centralised organisation with few exceptions where schools have their own IT department and supports.	• Decentralised organisation. • Attempts to bring it to a more centralised mode.	• Federal organisation. • Attempts to bring the organisation to a more centralised mode.	• Federal organisation.
1.2	IT Governance Design	• Various committees are used with clear committee responsibilities.	• Various committee are used but with unclear committee responsibilities (who has inputs and who makes decision).	• Various committees are used with clear committee responsibilities.	• Various committees are used with clear committee responsibilities.
1.3	Decision-Making Behaviour	• Stakeholders have inputs. • IT Director and PVC-TIS as decision makers.	• Stakeholders have inputs. • Unclear who make decision. • IT Director perceives himself as "participant".	• Stakeholders have inputs. • CIO and IT Managers as decision makers.	• Stakeholders have inputs. • CIO and Deputy Vice-Chancellor as decision makers.
2	**People**				
2.1	Leadership	• Cost leadership. • Reactive. • IT efficiency, effectiveness and flexibility are sought. • IT is seen as cost and core business.	• Cost leadership. • Ad hoc and reactive. • IT efficiency, effectiveness and flexibility are sought. • IT is seen as cost and support.	• Strategic leadership. • Proactive. • IT efficiency, flexibility, innovation and exploitation are sought. • IT is seen as enabling technology.	• Strategic leadership. • Proactive. • IT efficiency, flexibility, innovation and exploitation are sought. • IT is seen as enabler and innovator.
2.2	Roles and responsibilities	• Clear and explicit definition of roles and responsibilities.	• Clear definition of roles and responsibilities but poor execution. Grey areas between central IT and departmental IT units.	• Clear and explicit definition of roles and responsibilities.	• Clear and explicit definition of roles and responsibilities.

Item	Description	Risk Management		Value Delivery	
		Case A	Case B	Case C	Case D
2.3	Commitment and Participation	• Active involvement from senior management	• Lack of commitment and participation from senior management.	• Very active involvement from senior management.	• Active involvement from senior management.
2.4	Awareness and Understanding of IT Governance	• IT governance is seen from technical perspective and control perspectives.	• IT governance is seen as the mandate of who in-charge is supposed to do.	• IT governance is seen as an overarching framework and communication perspective (to have common understanding).	• IT governance is seen as decision-making process and communication perspective.
3	**Process**				
3.1	Tools and Techniques	• Mainly best practice frameworks together with internal developed frameworks are used.	• Limited frameworks usage – risk register, ITIL.	• AS8015, best practice frameworks, and internal develop frameworks are used.	• Internal developed framework used, ITIL aspects.
3.2	Alignment Process	• Align with organisational goals.	• Limited alignment with the organisational goals.	• Align with organisation goals tightly.	• Align with organisation goals tightly.
3.3	Communication Process	• Formal. • Limited strategic dialogue.	• Formal. • Complex communication. • Lack of strategic dialogue.	• Formal & informal. • Strategic dialogue.	• Formal & informal. • Strategic dialogue.
3.4	Performance Tracking Process	• Measurement of the technical and non-technical aspects of IT governance.	• Lack of formal performance tracking.	• Measurement of the technical and non-technical aspects of IT governance.	• Measurement such as in terms of cost, time and benefits.
4	**IT Decision Domains**	• IT decision is business driven. • Some forms of IT decision domains existed implicitly.	• IT decision is business driven. • No IT decision domains.	• IT decision is business driven. • Some form of IT decision domains existed implicitly.	• IT decision is business case driven. • No indication of any form of IT decision domains. Instead a portfolio management perspective is used on IT decision.

4.4   Chapter Summary

This chapter presented the results of the interviews with the IT Directors /
CIOs of the four case organisations. Each of the cases was analysed
individually under the IT governance dimensions: Structures, People,
Processes and IT Decision Domains and their sub-dimensions. The
discussion of the research findings across the cases and their mapping
against the theoretical framework for their similarities and differences are
outlined in Chapter 5.

CHAPTER 5 – DISCUSSION AND CONCLUSION

5.1   Introduction

This chapter provides a discussion of the major findings of the study and the conclusion of this thesis. Section 5.2 recapitulates what has been accomplished thus far in response to the two research questions identified for this study. These are followed by a discussion of the findings resulting from analysing the cases presented in Chapter 4. Limitations, as well as implications for further research arising from the study, are then presented. Recommendations are provided in Section 5.5 with the intention that they would be useful to practitioners to improve their IT governance as well as to give insights to academics on how IT governance is applied in reality. Finally, research contributions and conclusions are outlined.

5.2   Recapitulation

IT governance is a contemporary phenomenon that has been prominent for the last 10 years. Though it is considered an important constituent of corporate governance, its take-up rate is low (Krass, 2003). A literature review has shown that it is perceived as the weakest link within corporate governance. Previous studies indicated that one of the foremost problems of IT governance is a lack of consensus in its definition (see Chapter 1). The different perspectives used to interpret IT governance, and the inconsistent and unclear understanding of IT governance, means its effectiveness may be compromised in real life.

This study was motivated by the fact that having a clear definition of IT governance is indispensable and is the first step to achieving successful IT governance. In addition, it is also the researcher's interest to investigate how IT governance has been performed in practice. This study provides a review of what a number of case organisations have achieved and how their IT governance is applied relative to current theories so that the gap between theory and practice can be determined.

Therefore, the purpose of this study was two-fold: (1) to develop the theoretical dimensions of IT governance, (2) to use the dimensions as the basis for examining how organisations are conducting their IT governance. Specifically, the research questions set out in this study were:

1. What IT governance dimensions can be extracted from current theoretical frameworks and best practice frameworks?

2. How are these dimensions reflected in practice?

To answer the first question, a detailed literature review was undertaken, drawing on a broad range of frameworks and research identified in prominent academic journals and industry-based standards (see Chapter 2). This literature review led to the development of IT governance dimensions where characteristics extracted from the literature were presented. They covered the following four main dimensions and their respective sub-dimensions:

- **Structures** - IT organisational structure, IT governance design and decision-making behaviour;
- **People** - leadership, roles and responsibilities, commitment and participation, and awareness and understanding;
- **Processes** – tools and techniques, alignment process, communication process and performance tracking process;
- **IT Decision Domains.**

To answer the second question, the case study research methodology was adopted as outlined in Chapter 3. This methodology was chosen because it emphasised "how" and "why" questions rather than "what" questions. It was particularly useful since IT governance is still a relatively new phenomenon and such an in-depth analysis can provide a rich description of data and insights into the phenomenon.

According to the Information Technology Governance Institute (ITGI), IT governance has five domains: strategic alignment, value delivery, risk management, resources management and performance management. Since time and resources were the major constraints of this study, two out of the five themes were pursued; these were risk management and value delivery which represent the two core elements of IT governance. Four case organisations were selected; they were divided into two groups (risk management or value delivery) based on their relative emphasis of IT governance within their organisations.

Data was collected mainly through semi-structured interviews with the IT Director or Chief Information Officer (CIO) of each organisation and documentary analysis of company documents such as strategic plans, annual reports and policy documents. Interviews were transcribed by the researcher and computer-assisted qualitative data analysis software NVivo was used to build the case study database. This was followed by coding of the data, mainly manual but complemented by an electronic approach, as part of the data analysis. In Chapter 4, the analysis for each case organisation were written up in the format of the theoretical framework focusing the "what" and "how" of IT governance.

In this chapter, a comparative analysis, mapping data gathered on each case organisation against the dimensions for patterns of similarities and differences, and the "why" aspect, are provided.

5.3   Discussion of Findings

Overall, the four main dimensions and their sub-dimensions, provided a suitable basis for analysing organisations' IT governance from a holistic point-of-view. The findings showed that there were various degrees of similarities and differences between organisations' actual IT governance and the dimensions listed. The following is a detailed discussion of the findings for each of the four dimensions: Structures, People, Processes and IT Decision Domains. The discussion provides insights and highlight issues that were uncovered in the course of the study. In addition,

recommendations are made to provide practical benefits to both organisations and academics.

5.3.1   Structures

The results of this study show that structure is a better understood dimension than other dimensions listed in the theoretical framework. The reason can be explained by the fact that traditional IT governance research is highly focused on this dimension given its importance to exercise control over IT (Ribbers, Peterson, & Parker, 2002; Webb, 2006). Furthermore, it is also one of the most visible dimensions (Weill & Ross, 2005).

5.3.1.1   IT Organisational Structure

The study showed that IT organisational structures varied from a centralised, through federal to decentralised mode. Although the formal IT organisational structures were different, discussions with IT Directors and CIOs indicated a general preference for the centralised mode even though many existing IT resources and services were distributed in faculties and business units. They felt that services required to be centralised. This position is logically defensible as the drawbacks of running a decentralised IT organisational structure are lack of resources and lack of consistency. From a management point-of-view, having a decentralised IT organisational structure was seen as high risk because of the weak control over IT. Efforts were continuously expended on streamlining their IT structure towards a more centralised mode.

These findings are in line with previous studies showing that organisations are shifting from a decentralised mode to a centralised mode. For example, de Haes & van Grembergen (2004) stated that many modern organisations today are taking on a federal structure with a hybrid design between centralised and decentralised mode of infrastructure, architecture and business application. Other studies (Mendez, 2005; Peterson, 2001) produced similar results by confirming that the trend of IT organisational structure is in the direction of a centralised mode from a decentralised or federal mode; increasing the consolidation of the supply service with IT

units (e.g. purchase of hardware and services and IT infrastructure) while decreasing the influence of IT decision by business units.

This study also demonstrated that there are contingent factors, prominently in play, which determine the choice of IT organisational structure. Organisation was not necessarily driven by the benefits gained through centralisation or decentralisation; instead the existing organisational structure overshadowed and determined the form of IT organisational structure. For instance, Case B remained in a very decentralised mode of IT organisational structure because of the resistance to centralisation by faculties and/or business units. Their reluctance to change appeared to have compromised the overall effectiveness of IT governance. As a result, Case B was still at initial stage of IT governance even though it had been in place for more than two years. The immediate question facing Case B is how faculties, business units and the IT units can cooperate effectively in order to meet the organisation's IT governance expectations more adequately.

As Johnson and Scholes (2002) noted, organisational structure reflects the power structure and delineates important relationships within the organisation. Organisation structure has also long been intertwined with organisation culture. While organisational culture could be viewed from many perspectives (see Schein, 1992), it is so closely entwined with organisation effectiveness in that a positive culture would enhance organisational effectiveness and vice versa (Barney, 1986). This could be observed when the CIO of Case C expressed the view that to make IT governance successful, it was important to "measure the temperature" of the organisation, which was clearly a reference to organisation culture. He repeatedly used the terms "shared meaning", "the interaction" and "common understanding" suggesting that these elements were needed to make an effective IT governance possible.

5.3.1.2 IT Governance Design

A limited number of committees were present in each of the case organisation concerning IT decision-making. Limited number and quality committees which function properly seem to be preferred to having a large number of ineffective committees (Weill & Ross, 2004b). Furthermore, the cases demonstrated the use of different committee structures, different mixes of stakeholders and well-defined terms of reference for various types of IT decision, the findings also showed that the cases have different levels of sophistication in using governance mechanisms. For instance, while all case organisations focused on the present timeframe, Case D, in addition, had a future focus on IT by setting up a committee to explore future use. Moreover, this committee included experts (both IT field and non-IT) from both inside and outside the organisation. This also highlighted the importance of having the "active and careful design" of IT governance structure emphasised by Weill & Ross (2004b).

5.3.1.3 Decision-Making Behaviour

In respect of the involvement of, and consultation with different stakeholders in IT decision-making processes, the study concluded that there were such mechanisms in place. Generally, the IT Director / CIO together with senior executives (e.g. PVC-TIS for Case A) made joint decisions. The exception was Case B where the IT Director perceived himself as a "participant" in decision-making. As stated by Peterson (2004a) and Weill & Woodham (2002), the emphasis in the decision-making behaviour should be on "who has inputs" and "who makes decision". This study however showed that there are other factors affecting the IT decision-making process, in particular, organisational culture.

5.3.2 *People*

While structures and processes appear to be the most common IT governance dimensions found in literature (Keynes-Pearce, 2002; Vitale, 2003), the people dimension seems less so (Capozzi & Singleton, 2002;

ITGI, 2003; van Grembergen & de Haes, 2005). In this study, the people dimension was intentionally made explicit. First, this was to assess whether or not it was an important element in IT governance. Second, it provided a more holistic view about the requirements for successful and effective IT governance. The findings showed that the people dimension was in fact a critically important dimension and should not overlooked during the implementation of IT governance.

5.3.2.1 Leadership

Leadership played a significant role in facilitating IT governance. This is reflected in senior management's view of IT and how they dealt with IT, whether it was treated as a cost (for example, supporting service) or an asset (for example, a business enabler) or steered the future direction of the organisations. Case A and Case B[11] treated IT as cost, making operational efficiency and effectiveness their focus. IT was seldom addressed during board meetings and IT governance processes were ad hoc and reactive. As a result, IT governance remained at an operational and internal level; there was not much IT strategic dialogue within top management.

In contrast, Case C and Case D treated IT as an asset and an enabling technology. In these two organisations, IT was explored outside the realm of operational efficiency and effectiveness. Organisations invested time to explore how IT could be fully utilised and made to drive the organisations forward. IT was treated in a strategic, external and future manner. There was a clear indication of strategic dialogue between top management and CIOs. In addition, senior management demonstrated their confidence in, as well as the acknowledgement of, the value of IT. Their positive attitude influenced other parts of organisations in regard to the acceptance of IT governance.

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[11] It should be remembered that Case A & Case B were selected for their emphasis on risk governance while Case C and Case D emphasised value governance. The above discussion reflects the findings in this respect.

These outcomes are consistent with previous research which found a positive relationship between leadership and the performance of IT governance. As Weill (2004) emphasised the level of leadership executed by senior business management in key IT decisions is the most significant factor distinguishing top-performers from sub-standard performers. Additionally, this study concluded that the characteristics of senior management at an individual level could facilitate or inhibit the effectiveness of IT governance. Ireland & Hitt (1999) described strategic leadership as a person's capability to anticipate, envision, maintain flexibility, think strategically and working with others to initiate changes that would create a viable future for organisations.

5.3.2.2   Roles and Responsibilities

The findings showed that organisations were generally very aware of the need to have well-defined and unambiguous roles and responsibilities in regard to IT governance. These were generally well documented and carried out in a formal manner. In addition, the IT Directors (or CIOs) reported to other, more senior executives who, in turn, reported to the Chief Executive Officers (Vice-Chancellors) of the organisations. Overall, this study showed that the accountability for IT governance fell on IT Directors (or CIOs) and the senior executives to whom they directly reported. This is consistent with the literature that senior executives should be accountable. To ensure roles and responsibilities are effective, they must be followed and understood throughout the whole organisation. Most important of all, individuals must take ownership of IT governance and integrate it into their daily responsibilities. The findings showed that the participants were able to describe their roles and responsibilities clearly and treated IT governance as part of their job responsibilities rather than as additional work.

The literature generally emphasises the formal aspects of documenting IT governance roles and responsibilities; the findings of this study suggested that this might not be sufficient by itself. For example, the central IT department in Case A developed around sixty-six IT policies, standards and

procedures that were posted onto its organisation's website for staff to access. However, it was reported that these documents were "off-the-shelf" and there was no assurance that staff were complying with them. There are trade-offs associated if IT governance is implemented through an overly formal approach; thus a greater flexibility is proposed. An approach which seeks to balance the "hard" (a formal and comprehensive approach) with the "soft" (an informal approach such as minimum standard, best practice or network approach) may be the most effective approach.

5.3.2.3 Commitment and Participation

This study found various levels of commitment and participation from senior management in respect of IT governance. Most noticeable were Case B and Case C with two contrasting levels of commitment and participation from senior management in IT governance. Senior management from Case B showed a much lower level of commitment than the senior management from Case C which resulted in IT governance being at an early stage.

Weill (2004) found that the more senior management were involved in IT governance, the better governance performance. As noted by Weill (2004), commitment and participation require a significant "buy-in" at executive level. Without that buy-in, IT governance will not be sustained. The key reason for this is that their endorsement of IT governance would prevent or minimise turf wars and politics inside organisations. Their level of commitment and participation was seen as virtually guaranteeing the success or failure of IT governance. By contrast, if senior management do not show interest or involvement in IT decision-making process, organisation members would not believe in such projects, and organisations could possibly suffer a disjunction between business objectives and IT capabilities. As Robinson (2005) confirmed, initiatives should be backed by all levels of leadership within organisations and should obtain sponsorship from senior executives.

5.3.2.4   Awareness and Understanding

There were different levels of awareness and understanding of IT governance amongst the case organisations. Apart from Case C, in which the IT governance was defined from a more holistic point-of-view, the rest of the organisations held a more limited perspective or described the concept to only to a limited extent. These findings are consistent with previous studies in the literature which found that a proper understanding of IT governance is still lacking (A. E. Brown & Grant, 2005; Robinson, 2005).

Case C appeared well ahead of the other cases of this study for a number of reasons. The time factor may be one due to its relatively longer history of IT governance implementation. Furthermore, it had senior management in leadership positions who are able to accurately describe their IT Governance approach. Weill (2004) showed this to be an important predictor of high governance performance. The more senior management understand the concept of IT governance, the more they tend to adopt a holistic approach in implementing IT governance rather than taking a narrow perspective or approach. Many current organisations narrowly focused on certain aspects of IT governance, mainly on risk and control, without considering governance from a broad perspective that could be used to enhance the value of IT for organisations (PricewaterhouseCoopers, 2007). Awareness and understanding of senior management of IT governance would be cascaded and mirrored in how the rest of the organisation perceives IT governance. IT governance becomes ingrained into the organisation's management culture.

5.3.3   Processes

This dimension received much attention as a result of the long-established process perspective of IT governance.

5.3.3.1 Tools and Techniques

The results showed that most of the participating organisations (Case A, Case C and Case D) used both externally frameworks as well as internally developed frameworks for IT governance. However, generally their use of IT governance frameworks was need-driven rather than methodological-driven. Case C and Case D emphasised that none of the current IT best practice frameworks they were aware of qualified adequately as governance framework. In their opinion, IT best practice frameworks tended to focus on processes or mechanisms only. However, as identified in the literature review, IT governance should not be a synonym for best practice framework (or industry-based standards). The study illustrated the higher level of understanding of IT governance in Case C and Case D since they looked at high-level frameworks. In particular, Case C had adopted an overarching IT governance framework that was recently developed and agreed by the senior management.

An interesting finding was that though project management methodology cannot be considered an IT governance framework, Case A, Case C and Case D stressed the importance of having such a methodology in place to supplement the IT governance processes. They explained that a project management approach is required to ensure a timely project delivery and highlight the benefits and values of IT to the organisation.

5.3.3.2 Alignment Process

All organisations understood that IT governance did not work independently and needed to be linked back to corporate governance and the overall organisational strategy. The results of this study are in line with extensive literature which places a strong emphasis on the relationship and alignment between IT governance and the wider context of corporate governance.

Furthermore, IT decision-making was generally driven by business process cycles or business cases. However, in Case A and Case B, where IT is viewed as a cost and supporting service, the IT expenditures could be compromised and constrained without considering the strategic benefits

that IT could bring to the organisations. IT projects could become captive to business cycles rather than strategic planning to drive organisations forward by taking advantage of new technologies.

5.3.3.3 Communication Process

Communication is a key dimension to the success of IT governance. The findings of this study showed that all case organisations predominately used formal channels as communication means. While this is the traditional focus, these are not the only means nor necessarily the most effective means for communication. The study showed that to get communication across the organisation, informal channels such as a network approach, shared learning and dialogues must supplement formal communications. IT governance is a strategic matter and should be initiated from the top level.

The findings showed that strategic dialogue helped create open discussions around IT governance, that is to understand IT governance, its scope and how it contributes to the goals of organisations. Such a strategic dialogue moves divergent understandings of IT governance towards a common view. Effective communications also improved coordinations between business units and IT units leading to the acceptance of IT as a valued service provider rather than just a cost of doing business. However, the study showed variations, from lack of strategic dialogue (in the case of risk emphasis in Case A and Case B) to presence of strategic dialogue (for value emphasis in Case C and Case D).

5.3.3.4 Performance Tracking Process

To demonstrate value, it is important for organisations to track their performance particularly if they want to justify the adoption of IT governance. However, the findings of this study showed that this was the weakest of all dimensions. It was a dimension where less-than-adequate attention was received from all the case organisations.

According to PricewaterhouseCoopers (2007), IT governance is not being properly measured and managed. One reason is that there is a lack of consensus within organisations about what to measure given performance is viewed from different perspectives. As van Grembergen & de Haes (2005) suggested, a good balance of measures focusing on output and performance, are required. This would include both technical indicators and business indicators. Technical indicators refer to measures such as downtime and percentage access failure, while the business indicators refer to measures such as customer satisfaction and dollars spent per customer. These two types of measure are inter-connected and the lack of either one will result in insufficient and incomplete measurements.

It was noticeable that Case A struggled to find appropriate performance metrics measurements. Though there are frameworks such as Balanced Scorecard measurements and benchmarking available, it was perceived that they were not particularly suitable to their organisational context and thus the organisation attempted to develop internal measures to gauge performance. In Case D, the CIO argued that performance measurement was not a useful tool. He perceived that performance measurement only documented past results rather than providing insights for future planning. However, it should be remembered that past results can prove a useful baseline to guide future actions and expectations.

5.3.4   *IT Decision Domains*

The findings showed that IT decisions were driven by the business cycle, organisational needs or portfolio management. Even in organisations with well accepted IT decision domains (i.e. IT principles, IT infrastructure strategies, IT architecture, business application needs, IT investment and priorisation) in place, IT decisions existed in a very subtle form and were embedded into business process[12]. The closest was Case C which mapped the four domains of planning, investment, infrastructure application operation and client which had some resemblance with traditional theoretical IT decision domains.

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[12] For more information, see Section 2.6.4 which covers IT decision processes.

5.4 Limitations and Further Research

All research has limitations. The purpose of this study was to fulfil the doctoral degree requirement within which time and resources were major constraints. This section summarises the limitations that have emerged during the course of the study. These limitations, however, also identify opportunities for further research.

The first limitation is the development of the theoretical dimensions. The design of the literature review has the specific goal of synthesising a theoretical framework by analysing a range of selected academic-based and best practice IT governance framework literature. Given there are quite a number of best practice frameworks, only the four most robust best practice frameworks were included in this literature review, i.e. ValIT, COBIT, ITIL® and ISO17799. From this, a set of research dimensions and sub-dimensions were developed which could be further elaborated. The approach used in the literature review may possibly establish a specific and limited perspective on the dimensions and sub-dimensions required for the framework. It is therefore recommended that the dimensions of the proposed theoretical framework are further developed and validated to support its practical use in different contexts. For example, this could include the analysis of the other best practice frameworks which may provide additional and valuable insights into the dimensions that could be also important in IT governance.

The second limitation reflects the nature of the data set collected. Four organisations were interviewed along two different themes (i.e. to use IT governance to achieve risk management or value delivery). This constrained number of cases limits the ability to generalise findings. Additional research could be replicated with a wider sample of organisations to provide more refined results and potential for generalisation. Furthermore, the research was restricted to the risk and value aspects of IT governance and this will influence the nature of the discussions. However, additional research could focus on using IT governance to achieve other governance objectives such as strategic alignment, resource management and performance management.

The third limitation is that the current results are produced from a specific sector of organisations. This homogenous Australian education institution context may have imposed limitations as different findings could arise if the studies were carried out in different contexts, for example government organisations, non-profit organisations or global companies where their focus and requirements on IT governance could be different.

The fourth limitation is the research design of this study. A cross-sectional study was conducted. This provides a snapshot of how organisations perform their IT governance at a particular point of time. No longitudinal data was collected due to time constraints. Therefore, the results did not provide a detailed insight into how the case organisations evolved and responded to IT governance over time. But by using this study as a reference point, future study incorporating a longitudinal research design could supplement our knowledge of how organisations change in response to IT governance over time. There would also be the opportunity for in-depth study into why and how the organisations developed and performed in specific ways.

The fifth limitation is possible influential factors outside and inside the organisations that may not have been included in this study. For example, the results of this study pointed to several issues that are critical to the success of IT governance. These include organisational culture, leadership and communication. Therefore, it would be interesting to further assess the role of organisation culture in facilitating the implementation of IT governance and its impact on effectiveness. Further studies could focus on CIOs – their characteristics, what they do, how they do and especially how they affect IT governance performance.

Finally, the process of data collection and data analysis could have created the limitations for this study. The research participants of this study were the CIOs / IT Directors of the organisations who are the key personnel involved in IT governance. However, it cannot be ruled out that each CIO / IT Director's own conceptual awareness of the questions, as well as their own historical backgrounds, could have influenced their answers rather

than giving an objective view.   This subjectivity could decrease the reliability of the data.   In addition, the case study approach itself has limitations.   It relies on the impartial analytical ability of the researcher to play down any data contamination.   It also depends on how the researcher interprets the data and codes it into the categories.   Such interpretation could affect the reliability of the data.   To minimise these subjectivities, secondary data and further literature sources were used to strengthen and confirm some of the claims and findings.   Further studies should include a broader range of participants, such as CEOs and key personnel from business units and IT units, of different levels in the organisation to serve as additional informants.

5.5   Recommendations

This study examined dimensions of IT governance in four case studies along the lines of the theoretical framework based on the literature reviewed in Chapter 2.   The following recommendations flow from the findings of the study.

Structures

- *IT Organisational Structure:* Adopt a centralised mode which seems best suited for IT governance.
- *IT Governance Design:* Design IT governance with care and get senior management actively involved in its design and implementation.
- *Decision-Making Behaviour:* Define the involvement clearly regarding who has inputs and who ultimately make decisions.

People

- *Leadership:* Practise strategic leadership that recognises IT governance as an important element to drive the organisation forward.
- *Roles and Responsibilities:* Define roles and responsibilities clearly but balance the hard approach (e.g. formal and comprehensive) with soft approach to ensure they are achieved.
- *Commitment and Participation:* Ensure significant commitment by the executive level to sustain IT governance.

- *Awareness and Understanding:* Understand IT governance from a holistic perspective.

Processes

- *Tools and Techniques:* Adopt an overarching framework / model to oversee all mechanisms and processes.
- *Alignment Process:* Ensure the linkage between IT governance and corporate governance and explore the full potential of IT governance.
- *Communication Process:* Use formal channels supplement by informal channels such as a network approach or lateral coordination.
- *Performance Tracking Process:* Improve performance tracking and measurement by balancing business and technical aspects.

IT Decision Domains

- Make IT decision domains more explicit to support IT governance.

5.6   Research Contributions

There are several contributions of this study relevant to both the research community as well as practitioners.

First, most academic studies and best practice frameworks have tended to focus on a single or a few limited aspects of IT governance, such as process, structure or technical perspectives, without bringing all the aspects together. The various definitions apparent in the literature create confusion among practitioners as well as academics on understanding precisely what IT governance is. One of the main contributions of this study is to encourage convergence towards a common understanding of IT governance. This was achieved by dissecting a broad range of IT governance definitions and IT governance frameworks from relevant literature and synthesising theoretical dimensions. This provides the foundations for delineating what IT governance is. IT governance was perceived holistically as a system of co-dependent elements. The "theoretical framework" serves as an overarching framework which allows organisations to adapt and implement IT governance according to their particular organisational context, culture and strategies.

The second contribution of this study is to enhance the understanding of IT governance as practised currently in respect of risk management and value delivery. It is of benefit to organisations to learn from others as well as to reflect their own IT governance. They can also assess and map their IT governance against the theoretical framework in a consistent manner. This study raises the practitioners' and senior executives' awareness and understanding of IT governance both theoretically and practically.

Third, the study attempted to bridge the gap between theory and practice. IT governance should be highly practical and relevant to existing organisations. Knowledge about IT governance should not be only created inside the ivory tower of the research community. Dialogue and collaboration between the academic community and organisations are required to improve IT governance. The study achieved these through cross case analysis along the research dimensions. The contribution of this study is to provide insights to other researchers regarding IT governance performance and to practitioners to improve its application in a practical way.

5.7   Concluding Remark

To conclude this study, the finding of Gorry & Morton (1989, p. 49) on the power of a framework is cited:

> "A framework that allows an organisation to gain perspective on the field of information systems can be a powerful means of providing focus and improving the effectiveness of system efforts."

By using the theoretical framework developed for this study, it can be concluded that organisations are still in the early stages of their IT risk / value governance maturity and much further effort is required to blend and coordinate these dimensions before they achieve their full potential.

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Appendix A
Categorisation of IT Governance Dimension

Keywords / Key Phrases	Dimensions	Sub-dimensions	References
Locus of responsibility	Structures	Decision making behaviour	Brown and Magill (1994)
Not daily operational decision	Structures	Decision making behaviour	Henderson et al.,(1996)
Allocation of decision rights	Structures	Decision making behaviour	Henderson et al.,(1996)
Clearly delineated decision rights	Structures	Decision making behaviour	Henderson et al.,(1996)
How are they [decisions] made	Structures	Decision making behaviour	Vitale (2001)
Pattern of decision making	Structures	Decision making behaviour	Vitale (2001)
Sharing IT decision rights across the organisation	Structures	Decision making behaviour	Vitale (2001)
Types of decision (accountability, monitoring, strategy and policy)	Structures	Decision making behaviour	Vitale (2001)
Who makes decision	Structures	Decision making behaviour	Vitale (2001)
Encourage desirable behaviour	Structures	Decision making behaviour	Weill and Ross (2004)
Specifying decision rights	Structures	Decision making behaviour	Weill and Ross (2004)
Distribution of decision rights	Structures	IT governance design	Henderson et al.,(1996)
Focus of control	Structures	IT governance design	Henderson et al.,(1996)
Allocation of formal IT decision-making authority	Structures	IT governance design	Peterson (2004)
Distribution of IT decision-making	Structures	IT governance design	Peterson (2004)
Governance arrangement	Structures	IT governance design	Sambamurthy and Zmud (1999)
IT-related authority patterns	Structures	IT governance design	Sambamurthy and Zmud (1999)
Pattern of authority	Structures	IT governance design	Sambamurthy and Zmud (1999)
Associated authority pattern	Structures	IT governance design	Schwarz & Hirschheim (2003)
Platform logic for organising IT activities	Structures	IT governance design	Schwarz & Hirschheim (2003)
IT governance structures	Structures	IT governance design	Van Grembergen (2003a)
Governance arrangement matrix	Structures	IT governance design	Weill and Ross (2004)
Centralised, decentralised, recentralised	Structures	IT organisation structure	Brown and Magill (1994)
Organisational structures	Structures	IT organisation structure	ITGI (2003b)
Structural capability	Structures	Structure	Peterson (2004)
Connect and activiate structural frameworks	Structures	Structure	Schwarz & Hirschheim (2003)
IT capabilities	Structures	Structures	Schwarz & Hirschheim (2003)
IT related structures and architectures	Structures	Structures	Schwarz & Hirschheim (2003)
Link to capabilities	Processes	Alignment	Schwarz & Hirschheim (2003)
Fusion of business and IT	Processes	Alignment	Van Grembergen (2003a)
Coordination of IT decision-making expertise and influence (informal authority)	Processes	Communication	Peterson (2004)
Direct and coordinate	Processes	Communication	Peterson (2004)
Effective coordination	Processes	Communication	Peterson (2004)
Integration	Processes	Communication	Peterson (2004)
Relational capability	Processes	Communication	Peterson (2004)
Direct, control and coordinate	Processes	Communication	Sambamurthy and Zmud (1999)
Create relationship with the business unit	Processes	Communication	Schwarz & Hirschheim (2003)

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Appendix A
Categorisation of IT Governance Dimension

Keywords / Key Phrases	Dimensions	Sub-dimensions	References
Deliver the capabilities and the mechanisms	Processes	Communication	Schwarz & Hirschheim (2003)
Integration architectures	Processes	Communication	Schwarz & Hirschheim (2003)
Relationship architectures	Processes	Communication	Schwarz & Hirschheim (2003)
Coordination	Processes	Communication	Van Grembergen (2003a)
Integration	Processes	Communication	Van Grembergen (2003a)
Relational mechanisms	Processes	Communication	Van Grembergen (2003a)
Monitoring this use to achieve plans	Processes	Performanace Tracking	Australian Standards AS8015:2005
Making and monitoring strategic decisions regarding IT	Processes	Performanace Tracking	Peterson (2004)
Monitoring IT performance	Processes	Performance Tracking	Vitale (2001)
Acceptable and actionable IT measurement	Processes	Performance Tracking	Vitale (2001)
Direct and control	Processes	Processes	Australian Standards AS8015:2005
Evaluating and directing the plans	Processes	Processes	Australian Standards AS8015:2005
Processes	Processes	Processes	ITGI (2003b)
Procedures and mechanisms	Processes	Processes	Peterson (2004)
Process capability	Processes	Processes	Peterson (2004)
Control the formulation and implementation	Processes	Processes	Van Grembergen (2003a)
Processes	Processes	Processes	Van Grembergen (2003a)
Process	Processes	Processes	Vitale (2001)
Val IT, COBIT, ITIL, ISO17799	Processes	Tools and techniques	ITGI (2003b)
Awareness and understanding	People	Awareness and Understanding	Weill and Ross (2004)
Commitment and Participation	People	Commitment and Participation	Weill and Ross (2004)
Consists of the leadership	People	Leadership	ITGI (2003b)
Exercise by Board, executive management, IT management	People	Leadership	Van Grembergen (2003a)
Organisation capability	People	Leadership	Van Grembergen (2003a)
Key executives or partners	People	People	Henderson et al.,(1996)
Different stakeholders	People	People	Peterson (2004)
Roles responsibilities	People	Roles and Responsibilities	Henderson et al.,(1996)
Responsibility of the Board of Directors and executive management	People	Roles and Responsibilities	ITGI (2003b)
Responsibilities	People	Roles and Resonsibilities	Peterson (2004)
Accountability	People	Roles and Resonsibilities	Vitale (2001)
Clear accountabilities	People	Roles and Resonsibilities	Vitale (2001)
Accountability framework	People	Roles and Resonsibilities	Weill and Ross (2004)
System	IT decision domains	IT decision domains	Australian Standards AS8015:2005
IT function	IT decision domains	IT decision domains	Brown and Magill (1994)
IT activities	IT decision domains	IT decision domains	Henderson et al.,(1996)
Key IT activities	IT decision domains	IT decision domains	Sambamurthy and Zmud (1999)
Activities	IT decision domains	IT decision domains	Schwarz & Hirschheim (2003)
IT decision domains	IT decision domains	IT decision domains	Weill and Ross (2004)

Appendix A
Categorisation of IT Governance Dimension

Keywords / Key Phrases	Dimensions	Sub-dimensions	References
use of IT	IT decision domains	IT decision domains	Weill and Ross (2004)
Current and future use of ICT	Goals	Not Applicable	Australian Standards AS8015:2005
Strategies and policies for using ICT within an organisation	Goals	Not Applicable	Australian Standards AS8015:2005
Use of IT to support the organisation	Goals	Not Applicable	Australian Standards AS8015:2005
An integral part of enterprise governance	Goals	Not Applicable	ITGI (2003b)
Extends the organisation's strategy and objectives	Goals	Not Applicable	ITGI (2003b)
Organisation's IT sustains	Goals	Not Applicable	ITGI (2003b)
Build and create IT capabilities	Goals	Not Applicable	Peterson (2004)
Transparent, efficient and flexible mode	Goals	Not Applicable	Peterson (2004)
Accomplish IT imperative	Goals	Not Applicable	Schwarz & Hirschheim (2003)
Enterprise's environmental and strategic imperative	Goals	Not Applicable	Schwarz & Hirschheim (2003)
IT Strategy	Goals	Not Applicable	Van Grembergen (2003a)
Making decisions about IT	Goals	Not Applicable	Vitale (2001)
Transparent IT decision making	Goals	Not Applicable	Vitale (2001)

PART 1: The Opening (Contextual Information)

Respondent's Personal Information
Q1 Can you please state your name and your position in the organisation?
Q2 How long have you been working with the organisation?
Q3 What is your role in the organisation?

Organisation
Q4 What are the organisation's goals and objectives?
Q5 What is the size of the organisation?
Q6 What is the organisation structure like?
Q7 Who are your clients?
Q8 Who are the stakeholders of the organisation? (To whom does the organisation need to be responsible to?)

Information Technology in organisation
Q9 What is the role of IT in the organisation?
Q10 What is the IT strategy in the organisation?
Q11 How many IT staff do you have in your organisation?
Q12 What is the structure of the IT department?

IT Governance (broad theme)
Q13 In your organisation, what is the definition of IT Governance?
Q14 Who initiated IT Governance?
Q15 What are the main drivers to implementing IT Governance?
Q16 What are the objectives of IT Governance in your organisation?
Q17 What is your role in IT Governance?
Q18 Who is ultimately accountable for IT Governance?
Q19 What does IT Governance link to? (Corporate Governance? What is their linkage?)

Part II – The Body

Structures
Q20 What structure (committee) do you have in your organisation to support IT Governance to achieve Risk Management?
Q21 How often does the Risk Management Committee meet?

People
Q22 What is the level of expertise in your organisation to handle IT Governance to achieve Risk Management?
Q23 Who are involved in IT Governance decision making pertaining to Risk Management? Who make decisions and who has inputs?
Q24 What part does the senior management play in IT Governance and in particular Risk Management?

Processes
Tools and Techniques
Q25 *What are the standard processes / procedures for IT Governance to achieve Risk Management?*

Q26 *What framework do you use? Is it internally developed or externally adopted or a mix of both?*

Alignment Process
Q27 *What approaches does your organisation use to align IT Governance with Risk Management and the organisation's goals?*

Communication Process
Q28 *What approaches does your organisation use to communicate IT Governance to achieve Risk Management?*

Performance Tracking Process
Q29 *What approaches does your organisation use to track the performance of IT Governance to achieve Risk Management?*

Q30 *What do you track? IT Governance (Risk Management) itself or the benefits as a result of IT Governance (Risk Management) or both?*

General Questions
Q31 *What other processes / mechanisms do you use in relation to IT governance to achieve Risk Management?*

Q32 *What are the benefits of implementing IT Governance to achieve Risk Management in comparison with Risk Management without IT Governance?*

Q33 *If the process / procedure is not standard, how will the exception be handled?*

IT decision domain areas
Q34 *Do you divide the IT decisions by functions or by domain areas?*

Q35 *What domain areas do you look at in IT Governance, in particular Risk Management?*

Part III – The Closing

Q36 *In your opinion, what are the critical success factors for an IT Governance implementation and in particular to achieve Risk Management?*

Q37 *In your opinion, to what extent does your organisation achieve Risk Management as IT Governance?*

Q38 *Is there any other organisation's specific experience in implementing IT Governance in general, or specifically as Risk Management, you would like to share with me?*

Appendix C
An Information Letter to Participant

5 September 2007

Dear Sir

Research Titile: Dimensions of IT Governance: A Comparison of Theory against Practice
Invitation to Participate in Research Project

I am a doctoral student who is currently doing a Doctorate Degree in Business Administration at Edith Cowan University. To fulfil the final part of the academic requirements, I am required to undertake a research project to complete the studies. My research topic is *"Dimensions of IT Governance: A Comparison of Theory against Practice"*. It aims to discover and examine the dimensions of IT Governance that organisation(s) are currently using and to compare them with the dimensions that are synthesised from a selected broad spectrum of literature covering frameworks (or models) and best practice frameworks. Your organisation is being approached because it has experience and knowledge about the research topic.

The procedure of this research as it affects you is to conduct an interview. Interviews with key management will be about the current IT Governance practices in your organisation. It is anticipated that the duration of each interview should take no more than 90 minutes. Any follow-up required will be predominantly done by email or phone at your convenience. However, should any follow-up interview be required, I will contact you again to arrange another interview. I do understand that your time is precious and will endeavour to keep the follow-up interviews as brief as possible (estimate max. 20 minutes).

The significance of this research is to bridge the gap between theory and practice and to raise the senior management's awareness and understanding of IT Governance. I will provide some feedback and suggestions at the end of the research process to you if this is wanted. The benefit of this research to your organisation is to learn about potential improvement for your IT Governance.

Interview will only be tape recorded if this is permitted by you. All data collected during the research will be stored in a secure area and will not be used for any purposes other than the conduct of this research. Confidentiality of data will be maintained at all times and will not be used to identify your organisation in any research findings. Should you feel uneasy during the interview, you are free to withdraw from further participation at any time.

I hope you will be able to participate in this exciting project. Should you agree to participate, kindly sign the attached Informed Consent document. You can contact me on _____ or by email _____ to find out more about the research.

Any questions concerning this project can also be directed to my research supervisor Associate Professor Dieter Fink of School of Management on _____ or by email _____. However, should you have any concerns or complaints about the research project and wish to talk to an independent person, you may contact:

> Research Ethics Officer
> Edith Cowan University
> 100 Joondalup Drive
> JOONDALUP WA 6027
> Phone: (08) 6304 2170
> Email: research.ethics@ecu.edu.u

I look forward to your participation.

Yours sincerely

Denise Ko
DBA Student
Edith Cowan University

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Research title: Dimensions of IT Governance - A Comparison of Theory against Practice

Informed Consent Document

Please read the following statements and tick the boxes where you have agreed:

☐	I have been provided with a copy of the Information Letter, explaining the project.
☐	I have read and understood the information provided.
☐	I have been given the opportunity to ask questions and have had any questions answered to my satisfaction.
☐	I am aware that if I have any additional questions, I can contact the research team.
☐	I understand that participation in the research project will involve interviews.
☐	I understand that the procedures that I am requested to participate in (as outlined in the Participant Information Letter).
☐	I understand that the interviews will be tape-recorded with my permission.
☐	I understand that the information provided will be kept confidential, and that my identity will not be disclosed without consent.
☐	I understand that the information provided will only be used for the purposes of this research project, and understand how the information is to be used.
☐	I understand that I am free to withdraw from further participation at any time, without explanation or penalty.
☐	I freely agree to participate in the project.

....
Name

....
Signature

....
Date

Research Team Contacts

Name	Tel	Email
1. Denise Ko – Chief Investigator		
2. Dieter Fink – Investigator Supervisor		
3. Research Ethics Officer		