The Factors Influencing ICT Governance Implementation in the Organisation:

A Case Study

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Declaration

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the qualification of any other degree or diploma of a University or other institution of higher learning, except where due acknowledgement is made in the acknowledgements.

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Signature

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Abstract

The emergence of Information and Communication Technology Governance (ICTG) as a field of study with a comprehensive literature permits focused studies in the area of ICTG in organisations. The key focus of previous studies is on the alignment of the organisation strategic direction and ICT strategy. Many organisations have implemented ICTG to gain efficiency, accountability, and regulatory compliance (Information Technology Governance Institute (ITGI) Report, 2008). Although many organisations have implemented ICTG, research reports show that many of these organisations still struggle to move forward from level 1 and 2 of the ICTG maturity model while some are still stuck at level 0 which indicates that there are factors that influence the implementation of ICTG in organisations.

The purpose of the research aims at studying and reporting the factors that influence the implementation of ICTG in organisations. To obtain these factors, the research first investigates how the organisation implements ICTG. Once those factors are identified then the research further investigates the causes of these factors and its relationship with ICTG. As a result, best practices can be formulated as guidance for ICTG implementation.

From a qualitative paradigm, an exploratory research was conducted through a case study at the case organisation which is called the 'Ministry' to protect participants' privacy. Qualitative data on ICTG were collected through the use of unstructured interviews, documents collection, and diary recordings. A theoretical framework is formulated from previous studies for implementation of ICTG. The framework shows that ICTG can be implemented through a mixture of three core mechanisms as main focus areas in ICTG implementation which are the structures, processes, and communications. Furthermore, the factors found from previous studies are identified to be classified into two main categories which are enablers and inhibitors indicating significant relationship between factors found and ICTG.

The research finds various factors arise from the findings in which some of these factors are similar to the ones reported in previous studies and therefore, validating the findings. These factors are classified into enablers and inhibitors

categories. The research also finds that the main cause of these factors is the inadequacy of ICTG mechanisms. Moreover, the research suggests that by encouraging enabler factors while minimising inhibitor factors will result on effective ICTG whereas by reducing enabler factors while encouraging inhibitor factors will result on ineffective ICTG. Thus, these factors are then set as benchmark for developing best practices for practitioners to adopt where and when applicable in the implementation of ICTG in the organisation.

Therefore, further research can be done to further investigate the impact of the most commented factors on the implementation of ICTG in organisations. Further research can also be done to investigate the effectiveness of the recommended practices in ICTG implementation. Furthermore, future research is recommended to be conducted on how ICTG stimulate the economy of a country especially in the developing countries.

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List of Abbreviations

CAQDAS	Computer-assisted Qualitative Data Analysis Software
CEO	Chief Executive Officer
CIMA	Chartered Institute of Management Accountants
CIO	Chief Information Officer
COBIT	Control Objectives for Information Technology
CMM	Capability Maturity Model
EG	Enterprise Governance
ERP	Enterprise Resource Planning
ICT	Information and Communication Technology
ICTG	Information and Communication Technology Governance
ICTM	Information and Communication Technology Management
ICTPP	Information and Communication Technology Project Proposal
IT	Information Technology
ITGI	Information Technology Governance Institute
ITIL	Information Technology Infrastructure Library
OECD	Organisation of Economic Co-operation and Development
OGC	Office of Government Commerce

Chapter 1
Introduction

1.1 Background

Information and Communication Technology (ICT) is recognised as the potential major driver of the economic growth in the 21st century (ITGI, 2001). ICT is rapidly growing with the emergence of the Internet to be recognized as vital component to the strategy plan of the organisation. According to a survey done by ITGI in 2006 on 695 organisations, 87% of the participants agreed that ICT is crucial to the strategy of the business (Lee, Lee, Park, & Jeong, 2008). In addition, Weill and Ross (2004) report that it is evident that organisations which are advanced in implementing ICTG and utilizing it effectively obtain profits of 20% and more. Weill and Ross again suggest that key driver for this improvement is for ICTG to define accountabilities for ICT-related business outcomes which will help organisations to align their business strategies with their ICT investment strategies.

Conversely, ICT has not been successful in its performance in some organisations according to the surveys conducted by Acadys and Standish Group in 2001. The survey finds that organisations tend to ignore the significance of ICT to the success of the business (ITGI, 2005). The survey also reports that ICT is not considered by management in the strategy plan of the business. Instead, ICT is perceived as tools for operation in the organisation. As a result, the existence of misalignment between the organisation and ICT leads to failure of many ICT projects. The survey reports that 49% of ICT projects fail and only 23% are successful.

Given the misalignment identified in the survey conducted by Acadys and Standish Group in 2001 and the vision stated by ITGI that ICT is a potential major driver of the economy, and the importance of ICT as the best strategy of the business improvement. Thus, ICTG emerges to be the working solution to improve the alignment between the organisation and ICT in order to realise the capability of ICT for delivering competitive advantages and profits to the organisation. ICTG is part of the corporate governance and it consists of leadership and organisational structures and processes that ensure that the

organisation's ICT is supporting the organisation's strategies and objectives (ITGI, 2003). According to a 2000 McKinsey Report, Investors have now realized the importance of governance and offering to pay 20% shares on organisations that are willing to adopt ICTG (ITGI, 2005). Society and regulators also acknowledge their awareness of the importance of ICTG in demanding executives and board members of the private and public sectors to be more transparent and accountable (ITGI, 2005). For example, the President's Commission on the Critical Information Infrastructure initiative in the United States stress to corporate officers the importance of awareness on ICT risks on the nation's information infrastructure. Moreover, the boards of companies in the London Stock Exchange are encouraged to address corporate risks and be transparent about those risks.

Furthermore, Broadbent and Kitzis (2005) state that good ICTG helps the organisation to make better and faster ICT-related decisions. Good ICTG also builds trust within the ICT division whereby ICT leader decisions are trusted by his staff when those decisions are transparent. In addition, effective ICTG improves the delivery and the credibility of ICT whereby only ICT projects that support the organisation goals should be implemented. Good ICTG also links ICT strategy with business strategy and promotes desirable behaviours in the use of ICT such as minimising cost, sharing of data, and stimulation of innovation resulting in a more effective business.

1.2 Motivation

ICTG has become top in the agenda of many developed countries such as Australia and America as many studies on ICTG have been conducted in these countries. However, this is an opportunity to conduct a research on ICTG in a country from the developing countries of the South Pacific islands. The research is also a great opportunity to address the importance of ICTG to the economic growth of Tonga given its current status in economy revival or so called "depressed economy growth" according to the Minister of Finance (Fonua, 2009). The Minister of Finance indicates that whilst the economy of Tonga is experiencing a low growth, it is also expected that the current year would not reach 1 percent of growth (Fonua, 2009). However, it will be interesting to find out how the organisation in Tonga implements ICTG to find out the factors that

influence the implementation of its ICTG as a foundation for future research to investigate how ICTG could stimulate the economic growth in Tonga. In fact the aim of this study is not specifically for Tonga but to find lessons that are learned from this study and applicable to any organisation in the developing world.

Furthermore, although some research has been done on the area of ICTG such as a study by Van Grembergen and De Haes (2008) on the enterprise governance of IT, study by Van Grembergen and De Haes (2005) on how organisation implements ICTG using a mixture of structures, processes, and relational mechanisms, study by Weill and Ross (2004) on how top performers manage ICT decision rights for superior results through ICTG, study by Lee et al. (2008) on the relationship between ICTG inhibitors and its success in Korea enterprises, study by Luftman et al. (1999) on the enablers and inhibitors of business/ICT alignment, and study by Bhattacharjya and Chang (n.d.) on the implementation and effectiveness of ICTG processes in higher education institutions in Australia, less research is found specifically on factors influencing ICTG implementation in organisations. There is also lack of research on the area of ICTG to be found from the South Pacific countries. However, these are the motivation for the research to be conducted to study how ICTG is implemented in an organisation from the South Pacific countries with specific focus on finding out the factors that influence ICTG implementation. As a result, best practices can be developed to assist practitioners in implementing effective ICTG in organisations.

1.3 Purpose

Given the significance of ICTG identified above to the success of organisations as well as the economy of a country, the main purpose of the research is to investigate the factors that influence the implementation of ICTG in the organisation in order to develop best practices for practitioners in ICTG implementation. However, the following research questions are raised to help with the investigation of those factors. What are the factors that influence ICTG implementation? How does the organisation implement ICTG? What are the causes of these factors? What is the relationship between these factors and ICTG?

In order to answer the research questions, the author went through the following structured research approach by defining the research questions, conducting literature research, designing a research methodology, conducting the

research, reporting on the findings, discussing the findings, and making recommendations as contribution to ICTG knowledge domain and for future research.

1.4 Implication

The research wants to contribute to the ICTG body of knowledge by finding out factors that influence the implementation of ICTG in organisations. The research will be an exploratory research to gain better insights and understanding of how ICTG being implemented in the organisation in order to determine the factors influencing the implementation of ICTG. The causes and effect of these factors will also be investigated. These identified factors will then be set as benchmark for developing of best practices to assist practitioners with the implementation of effective ICTG in organisations.

1.5 Structure of the Dissertation

This dissertation is structured as follows. Chapter 2 provides literature from previous studies on various areas on ICTG. Chapter 2 starts with the definition of enterprise governance and ICTG and identifies how ICTG fits in within the enterprise governance framework. Chapter 2 then identifies various ICTG frameworks and mechanisms for implementation of ICTG. Some guidance for the implementation of ICTG and factors that influence ICTG implementation are also identified in this chapter.

In chapter 3, a research methodology for data collection and analysis for the research is developed. Chapter 3 identifies that a qualitative approach using case study methodology as the suitable approach for conducting the exploratory research. The exploratory research allows the author to gain better insights and information on ICTG implementation in the Ministry. Within the case study methodology, there are three methods described for collecting primary and secondary data which are the unstructured interviews, documents collection, and diary recording. Chapter 3 also identifies that thematic analysis is the suitable method for analysing primary and secondary data collected in the research.

In chapter 4, the findings of the research are reported. Chapter 4 starts by describing some of the issues and problems faced by the research follow by the description of the findings as outcome from the qualitative analysis of the

interviews, documents, and diary recording collected in the research. Chapter 4 concludes with a summary of various mechanisms for implementing ICTG and factors that influence ICTG implementation.

In chapter 5, the author discusses the findings in the research through comparisons and contrasting of the findings in chapter 2 against the findings reported in chapter 4. In doing so, chapter 5 discovers ICTG mechanisms frameworks and best practices are developed for implementing effective ICTG in organisations.

In chapter 6, a conclusion is drawn and limitations and recommendations for future research are identified. The main conclusion of the research comes down to answering the research questions and summarising the recommended practices as guidance for ICTG implementation. Chapter 6 closes with recommendations for future research such as studying the impact of the most commented factors on ICTG implementation, studying the effectiveness of the recommended practices in ICTG implementation, and studying how ICTG stimulate the economy of a country especially in the developing countries.

At the end of this dissertation, a full list of references and appendices are included as well.

Chapter 2
Literature Review

2.1 Introduction

This chapter reviews a selection of literature that is termed 'the literature' for ICTG. In section 2.2 defines enterprise governance (EG) and how ICTG fits into EG of the organisation. A definition of Information and Communication Technology Governance (ICTG) is given in section 2.3. Based on these definitions and understandings, the chapter further elaborates the field of ICTG challenges and issues. There are various issues which can be derived from the research topic such as the ICTG frameworks, implementation of ICTG, and factors that influence ICT implementation. This chapter will describe various existing frameworks and models of ICTG in section 2.4. In section 2.5 a description of various mechanisms for implementing ICTG are reviewed. In section 2.6, guidance for implementing ICTG are outlined. Factors that influence the implementation of ICTG in the organisation are identified in section 2.7. A conclusion is drawn in section 2.8. .

2.2 Defining Enterprise Governance

In most research papers, the term 'corporate governance' (CG) is used in place of 'enterprise governance' (EG). For example, the Australian National Audit Office defines corporate governance as processes that direct and control an organisation (Webb, Pollard & Ridley, 2006). Similarly, the Australian Stock Exchange Governance Council defines that corporate governance is a system for directing and managing an organisation which influences the development and achievement of organisation objectives, monitoring and assessing of risks in the organisation, and optimising the performance of the organisation.

The terms 'enterprise governance' and 'corporate governance' are used as two different entities in this dissertation. Corporate governance is a subset of enterprise governance. Brand and Boonen (2005) describe EG as the main governance framework that covers all governance frameworks in the organisation including corporate governance and business governance as demonstrated in figure 2.1.
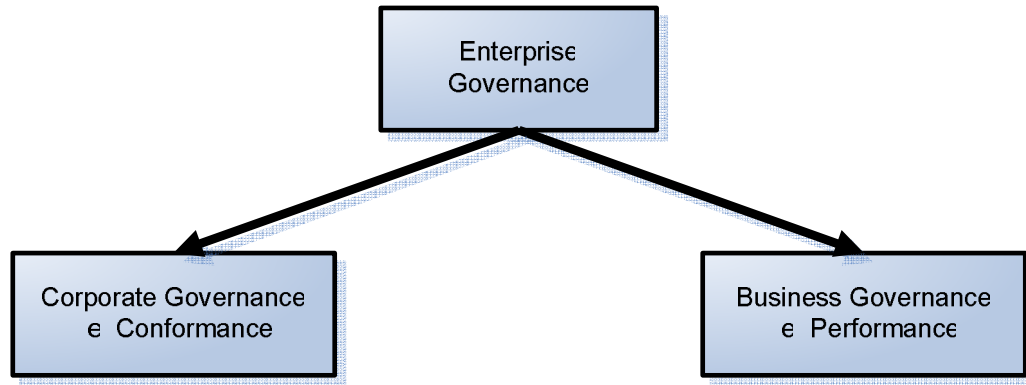
Figure 2. 1: The enterprise governance framework
(Source: Adapted from CIMA, cited in Brand and Boonen, 2005, p.14)

The Chartered Institute of Management Accountants (CIMA) defines EG as

"set of responsibilities and practices exercised by the board and executive management with the goal of providing strategic direction, ensuring that objectives are achieved, ascertaining that risks are managed appropriately and verifying that the enterprise's resources are used responsibly" (Brand and Boonen, 2005, p.2).

Corporate governance deals with the conformance aspects of the EG whereas business governance deals with the performance aspects of the EG. In other words, corporate governance ensures that organisation is complied with enterprise rules and regulations whereas business governance ensures that the enterprise objectives are achieved. According to the Organisation of Economic Co-operation and Development (OECD), corporate governance sets out rules and policies for making corporate decisions in the organisation (Brand and Boonen, 2005). Corporate governance also specifies the rights and responsibilities of each stakeholder in the organisation such as board, executive management, and shareholders. On the other hand, business governance is concerned with the role of the board in making strategic decisions, risk assessment, and understanding the drivers for business performance. Since that ICT is an integral part of the enterprise operations, the attention to corporate and business governance encourages more attention to ICTG in ensuring that ICT is supporting the enterprise objectives.

2.3 Defining ICT Governance

According to Information Technology Governance Institute (ITGI) (2001, p.9), ICTG

> *"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 Information Technology (IT) sustains and extends the organisation's strategies and objectives".*

ITGI further defines the purpose of ICTG which is to direct ICT endeavours to ensure that performance of ICT meets with the following objectives: align ICT with the organisation and realize the promised benefits, use ICT to exploit opportunities and maximizing benefits for the organisation, use ICT resources responsibly, and manage ICT-related risks appropriately.

Similarly, Van Grembergen (2002, cited in De Haes and Van Grembergen, 2005; Van Grembergen and De Haes, 2008) defines that ICTG

> *"is the organisational capacity exercised by the Board, Executive Management and IT management to control the formulation and implementation of IT strategy and in this way ensure the fusion of business and IT".*

Van Grembergen and De Haes (2008) in their new coming book extend the definition for ICTG to the emergence idea of "Enterprise Governance of ICT" as ICT becomes more crucial and more involve with business. Van Grembergen and De Haes (2008, p.18) define that Enterprise Governance of ICT

> *"is an integral part of corporate governance and addresses the definition and implementation of processes, structures and relational mechanism in the organisation that enable both business and IT people to execute their responsibilities in support of business/IT alignment and the creation of business value from IT-enabled business investments."*

Van Grembergen and De Haes (2008) also suggest that it is important to note that ICTG is different from ICT Management (ICTM). ICTM concentrates on the internal supply of ICT services and products and management of ICT operations within the organisation whereas ICTG is focused on performing and transforming ICT to meet with current and future demands of the organisation. However, ICTM is the prime responsibility of the head of ICT whereas ICTG is the prime

responsibility of the head of ICT together in cooperation with the executive management and the board of directors according to the definition of ICTG by ITGI (2001).

Brand and Boonen (2005) argue that ICTG is based on the following four principles: direct and control, responsibility, accountability, and ICT activities. Direct is the responsibility of managers to provide direction to implement change whereas control ensures that the objectives of ICT are achieved. Responsibility must be defined for every personnel in the organisation as part of their job description. Accountability is the responsibility of every personnel in the organisation to report or explain their actions on the use of resources that are given to them. So it is important for all personnel in the organisation to understand that they are held accountable for all of their actions. ICT activities are improved in the presence of good ICTG.

On the other hand, Weill and Ross (2004) argue that ICTG specifies "the decision rights and accountability framework to encourage desirable behaviour in the use of IT". Weill and Ross further emphasize that ICTG is different from ICT management. ICTG concerns with who makes the ICT decisions whereas ICT management concerns with how to implement those ICT decisions.

The definition from the ITGI emphasises that ICTG is not a separate component by itself in the organisation. Instead, it is part of the organisation enterprise governance. Thus, ICTG should be addressed as an important component of the enterprise governance similarly with any other governance in the organisation. ITGI identifies that ICTG has three main components – leadership, organisation structures, and processes. ITGI also identifies who is making decisions in ICTG, the characteristics of ICTG, and the purpose of ICTG. The board of directors and executive management are responsible for making decisions on how much the organisation invests in ICT. They should assure that ICTG is an integral part of enterprise governance and have leadership, organisational structures and processes to achieve business goals. Van Grembergen agrees that ICTG is the responsibility of the Board, Executive management and ICT management. Interestingly, Van Grembergen and De Haes highlight the three main components in ICTG which are structure, process, and relational mechanism and the importance of ensuring the alignment between ICT and business. In doing so, ICT can deliver business value for the organisation.

Hence, the purpose of implementing an ICTG is to ensure that ICT meets with the organisation's strategies and objectives. On the other hand, the definition of Weill and Ross focuses on who is making the decisions of how an organisation invests in ICT and the accountability for that decision, and how these decisions are made to achieve the organisation's strategies and objectives.

Although ICTG identifies what decisions are to be made, the purpose of these decisions, who makes those decisions, and how those decisions can be made, but the core purpose of ICTG lies with the alignment of ICT strategies with the strategies of the organisation through implementing of appropriate structures, processes, and communication mechanisms in the organisation.

2.4 ICTG Frameworks

There are many ICTG frameworks developed for the market, and four of these frameworks will be described in this section to highlight the focus and purpose of each framework with respect to implementation of ICTG. These ICTG frameworks are the COBIT, Val IT, ITIL, and COBIT CMM.

In sub section 2.4.1, the COBIT framework is described follows by the description of Val IT framework in sub section 2.4.2. The ITIL framework is described in sub section 2.4.3 and COBIT CMM model is described in sub section 2.4.4.

2.4.1 COBIT

Control Objectives for Information Technology (COBIT) is a product of International Systems Audit and Control Association (ISACA) which was developed originally as a framework for performing ICT audit assignments (Van Grembergen & De Haes, 2008). Later on, the COBIT framework was expanded with the addition of management guidelines including metrics and maturity models for ICT processes leading to the new release of COBIT 4.0 in 2005. According to Van Grembergen and De Haes (2008), COBIT 4.0 includes the concepts of ICTG such as the alignment of business and ICT goals and their relationship with supporting ICT processes, roles and responsibilities within ICT processes and the inter-relationship between ICT processes.

Recently, ITGI (2007) releases COBIT 4.1 which consists of its latest control framework model and standards for ICTG. According to ITGI, the control

framework for ICTG defines the reasons why ICTG is needed, the stakeholders in ICTG, and what goals ICTG requires to accomplish. The basic principles in this ICTG framework are: to provide information that the enterprise requires to invest in, manage and control ICT resources using a structured set of processes, and to deliver enterprise information that respond to business requirements as shown in figure 2.2.
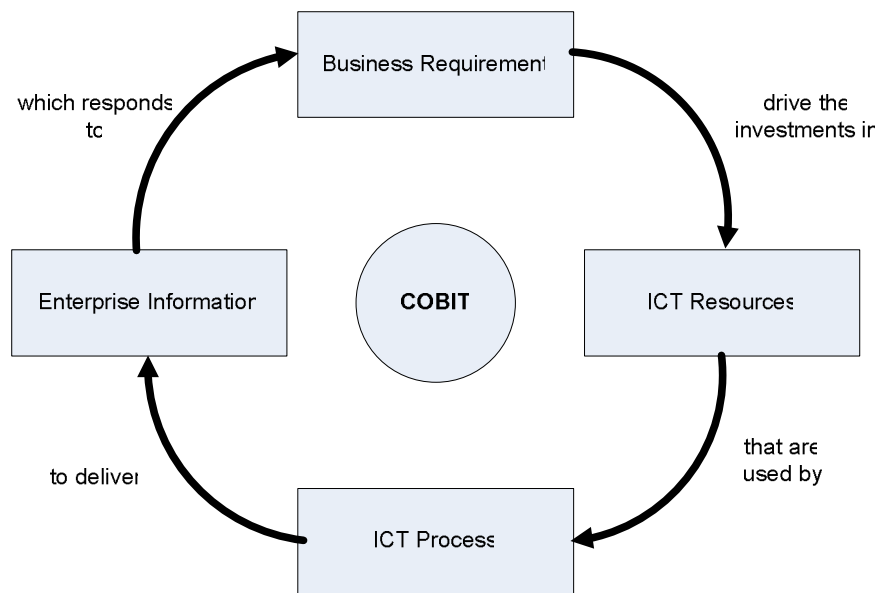
Figure 2. 2: Basic COBIT Principles
(Source: Adapted from ITGI, 2007, p.10)

At the heart of the COBIT framework is the managing and controlling of information to ensure its alignment with business requirements (ITGI, 2007). COBIT identifies seven criteria of business requirement which enterprise information is required to conform to. These criteria are effectiveness, efficiency, confidentiality, integrity, availability, compliance, and reliability. However, ICT processes have to conform to the criteria that business requirement sets out for its information and hence deliver enterprise information accordingly.

Furthermore, COBIT identifies that business goals and ICT goals must be defined to ensure that the goals of ICT meet with the goals of the business and also ensure that ICT goals are measurable (ITGI, 2007).

COBIT identifies four main resources in ICT that are required for delivering the enterprise information (ITGI, 2007). These resources are applications, information, infrastructure, and people. Applications are the automated systems and manual procedures for processing the information whereas

information is the processed data. Infrastructure is the technology and facilities that enable the processing of the applications and the people are the personnel required to manage, implement, and maintain the information systems and services.

Finally, COBIT provides an ICT process model which consists of three main categories which are domain, processes, and activities to enable the delivery of enterprise information (ITGI, 2007). The domain has four main stages which are plan and organise, acquire and implement, deliver and support, and monitor and evaluate. The plan and organise stage provides direction for solution and service delivery. The acquire and implement stage provides solutions which then be converted into services. The deliver and support stage obtains the solutions and delivers them to the end users. The monitor and evaluate stage monitors all processes to ensure that they follow the direction provided. Each domain has its own processes and each process has its own activities. More details on this can be found in COBIT 4.1. The COBIT framework is summarised in figure 2.3 below.
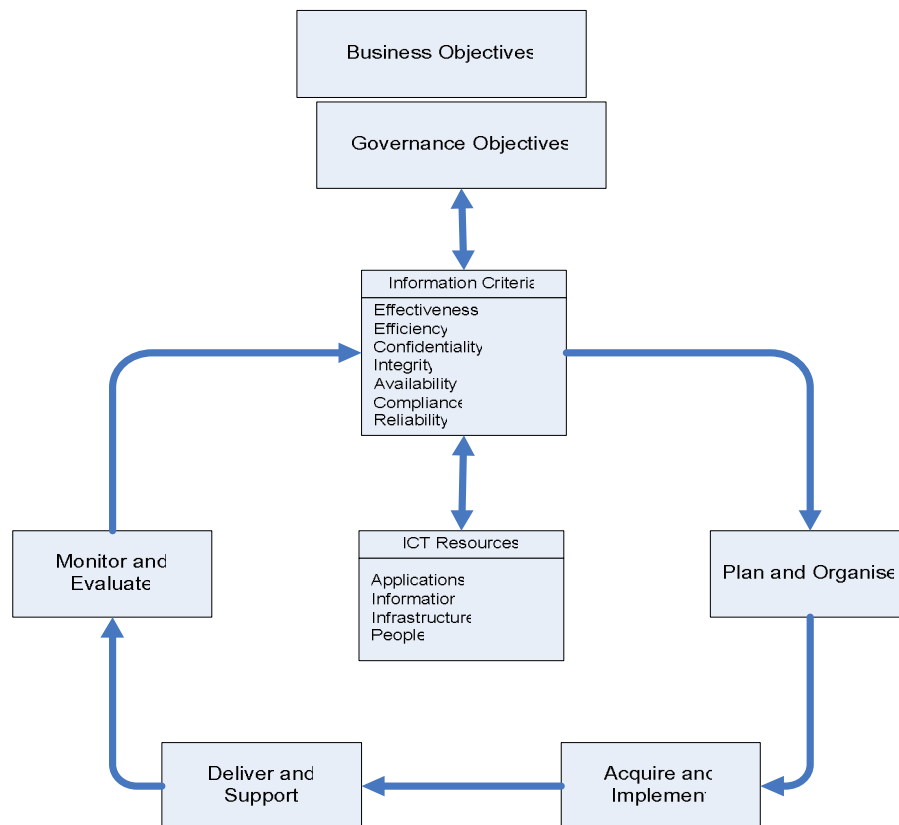
Figure 2. 3: COBIT Framework
(Source: Adapted from ITGI, 2007, p.26)

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2.4.2 Val IT

Val IT is a relatively new framework issued by ITGI which mainly focuses on the responsibilities of the business in creating ICT value (Van Grembergen & De Haes, 2008). According to ISACA (2009), Val IT is a governance framework based on COBIT framework which consists of guiding principles and supporting processes that assist in evaluating and selecting ICT-enabled business investments and realising the benefits and values from those investments. Brand and Boonen (2005) state that these guiding principles and supporting processes can be defined as set of key management practices. Furthermore, the Val IT framework provides guidance to help defining the relationship between ICT and the business and those organisation functions that have governance responsibilities, managing of an organisation's portfolio of ICT-enabled business investments, and capitalising on the quality of business cases for ICT-enabled business investments (Brand & Boonen, 2005; ISACA, 2009). Similarly, Van Grembergen and De Haes (2008) state that Val IT framework demonstrates that the value generated from ICT-enabled business investments are the responsibility of the business by utilising a set of ICT related business processes and associated key management practices, management guidelines, and maturity models.

In summary, the goal of Val IT is to assist management in ensuring that the organisation realises the values from ICT-enabled business investments at an affordable cost and acceptable level of risk (ITGI, 2006). To obtain this, the Val IT framework provides guidelines, processes, and supporting practices to assist executive management in carrying out their roles related to such investments (ITGI, 2006).

2.4.3 ITIL

Information Technology Infrastructure Library (ITIL) is a framework that was developed by the Office of Government Commerce (OGC) in Norwich, England, for the British government (Brand & Boonen, 2005). It provides guidelines and best practices for the ICT service management and also provides guidance to help improving customer satisfaction, enterprise productivity, the use of skills and experience, ICT services through the use of best practice processes, and reducing costs (ITIL, 2007). According to Brand and Boonen (2005), ITIL consists of guidelines for developing service strategies, service design, service transition,

service operation, and service improvement. Service strategies outline the overall ICT service management strategy and plan and also focus on issues on the alignment of ICT and the business and ICT governance. Service design provides policies and procedures for planning and designing processes for ICT service management in order to deliver the required business services. Service transition provides guidelines for transferring the designed services into the business environment. Service operation provides guidelines to ensure that designed services are implemented and supported effectively and efficiently in the business environment. Lastly, service improvement provides guidelines for identifying issues which need improvement in the designed services. ITIL is also a guideline for other frameworks too such as the Microsoft Operations Framework and the HP IT Service Management Reference Model (Brand & Boonen, 2005).

2.4.4 COBIT CMM

The Capability Maturity Model (CMM) is a model that consists of principles and practices that can help to assess the capability maturity of the software development process in an organisation with the aim to improve its software development processes (Brand & Boonen, 2005). The CMM model was developed by the Software Engineering Institute (SEI) of the Carnegie Mellon University and it was designed to evolve from one level to another through five maturity levels. These five levels are initial, repeatable, defined, managed, and optimising. The CMM model has been integrated in various areas in ICT such as Software Acquisition, System Engineering, Integrated Product Development and ICT services.

COBIT then adopted the CMM model and developed a model for assessing ICTG maturity in an organisation known as the 'COBIT CMM'. The COBIT CMM model assesses the maturity of processes described in COBIT domains and develops maturity goals for these processes. In contrast to SEI CMM, the COBIT CMM model consists of six levels of maturity. According to Brand and Boonen (2005), these maturity levels are non-existent, initial/ad hoc, repeatable but intuitive, defined process, managed and measurable, and optimised. The non-existent level suggests that there is no process of ICTG exists in the organisation. The initial/ad hoc level suggests that the organisation recognizes the need for ICTG implementation but there are no standardise processes exist accept

for some ad hoc processes applied on case-by-case basis. The repeatable but intuitive level suggests that standardised procedures and practices of ICTG exist in the organisation but these are not formalised and enforced onto individuals in the organisation. The managed and measurable level suggests that procedures are in place and processes have been developed to monitor and measure compliance with procedures to be more effective and efficient. These procedures and processes indicate that the ICTG in the organisation is under improvement and will continue on improving and there is also evidence of automation and tools used for processes. Lastly, the optimised level suggests that these processes have been improved to an external level of best practice. ICT is also used in an integrated way for processes automation and tools are used to improve the quality and effectiveness of processes in those organisations as well.

In view of the above frameworks by contrasting Val IT and COBIT framework shows that, according to the Val IT framework recently released by ITGI, Val IT focuses on the investment decision and realisation of benefits from ICT-enabled business investments whereas COBIT framework focuses on the execution and delivery of the ICT-enabled business investments in the organisation (ITGI, 2006). On the other hand, the ITIL framework focuses on the management of ICT services including service strategies, service design, service transition, service operation, and service improvement whereas COBIT CMM focuses on the assessment of the status of processes in the organisation against six maturity levels.

2.5 Mechanisms for ICTG Implementation

Weill and Ross (2004) state that "well designed, well-understood, and transparent mechanisms promote desirable IT behaviours". This means that by having good ICTG structure and processes in placed in the organisation, it will improve the efficiency and effectiveness of performance of ICT and as well as achieving the goals of the organisation. Weill and Ross present mechanisms as framework for the implementation of ICTG. These mechanisms are classified into three categories which are decision-making structures, alignment processes, and communication approaches. Decision-making structure identifies who is responsible for making ICT decisions such as ICT manager or ICT committee. Alignment processes focus on ensuring the daily behaviour to be consistent with

ICT policies including ICT projects processes. Communication approaches concern with propagating processes of the ICTG principles and policies and outcome of ICT decision-making processes in the organisation which involves training and consultation.

Similarly, De Haes and Van Grembergen (2005) propose that ICTG can be implemented through a framework by Peterson (2003) which comprises of structure, processes, and relational mechanisms. Structure is concerned with who makes the ICT decisions such as ICT organisation structure and ICT committees. Process is concerned with ensuring that ICT decisions made have values on the organisation and being monitored using various mechanisms such as information system planning, balanced ICT scorecard, COBIT or ITIL. Relational mechanisms ensure that proper communications are carried out between ICT and the organisation at all times.

Given the two frameworks outlined above for implementing ICTG, they both agree on three main mechanisms involve in the implementation of ICTG. Although the naming of these three mechanisms by these researchers is quite different, the principals remain the same. For example, Weill and Ross identify these three mechanisms as decision-making structures, alignment processes, and communication approaches whereas De Haes and Van Grembergen identify these three mechanisms as structure, processes, and relational mechanisms. However, it is apparent that there are three main mechanisms in the implementation of ICTG. This study identifies these three main mechanisms as main focus areas in ICTG which are the structures, processes, and communications as demonstrated in figure 2.4. The structure mechanisms identify who are responsible for making ICT decisions whereas process mechanisms ensure that ICT is supporting the organisation objectives. The communication mechanisms focus on communicating ICTG throughout the organisation to ensure that ICT is understood by the organisation. These three focus areas in ICTG will be described in details in the following sections.
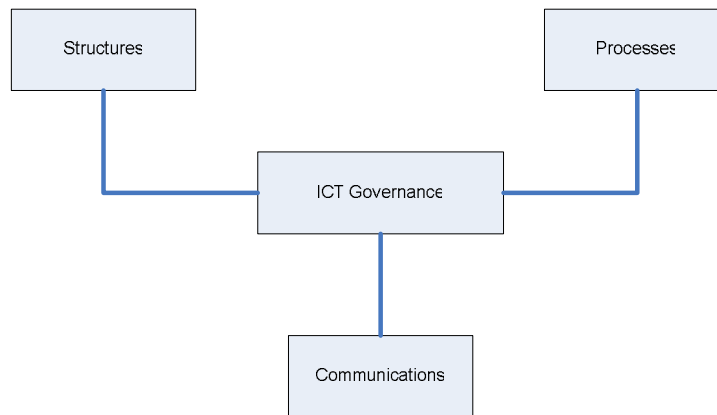
Figure 2. 4: ICTG Implementation Framework
(Source: Adapted from De Haes and Van Grembergen, 2005, p.2)

In section 2.5.1, ICTG structures focus area is described followed by the description of ICTG processes focus area in sub section 2.5.2. The ICTG communications focus area is described in sub section 2.5.3.

2.5.1 Structures

The ICTG structure focus area is concerned with how the ICT department is organised to determine its responsibilities and decision making and also how it is related to other departments in the organisation. There are various ways of how to structure ICT department in the organisation. According to Broadbent and Kitzis (2005), the traditional way of structuring ICT department in an organisation is recognised as a centralised data-processing department where all ICT related services, processes, and issues are centralised in the ICT department. Another way of structuring ICT department in an organisation is through decentralisation where each department in the organisation has its own ICT personnel. Some organisations adopt a mixture of these two strategies by incorporating a centralised ICT department and having some ICT personnel to provide basic ICT troubleshooting services within some of the other departments in the organisation. Broadbent and Kitzis also state that the new era of structuring ICT department is through sourcing of ICT services by outsourcing part of ICT services while maintaining its core support services of business functions. For example, ICT infrastructure like data center operations and network management can be outsourced while in-sourcing the development, maintenance, and integration of application and systems. Although there are various ways of structuring the ICT

department in an organisation but there is no particular structure that can fit all organisations requirement to deliver a better ICTG. There are benefits and disadvantages of each structure. Structuring an ICT department is largely dependent on the functions and objectives of that organisation.

Weill and Ross (2004) argue that organisational structures are the most visible ICTG that identify the decision-making responsibilities according to its archetypes. Weill and Ross also identify six types of archetype that represents people who are involved in making ICT decisions in the organisation. These archetypes are business monarchy, ICT monarchy, feudal, federal, ICT duopoly, and anarchy. Business monarchy consists of top managers in the organisation which may or may not involve the leader of ICT department or so called 'Chief Information Officer' (CIO) whereas ICT monarchy consists of ICT specialists in the organisation. Feudal archetype consists of leaders in each business unit who can each make their own ICT decisions whereas federal consists of members from corporate center and business units and with or without ICT people. ICT duopoly consists of ICT people and some from other business units whereas anarchy refers to individuals or small group that make ICT decisions. Weill and Ross find that in some enterprises such as DBS Bank, Chief Executive Officer (CEO) is directly involved in making ICT decisions together with a small group of top executives. This is an example of a business monarchy archetype structure. Similarly, some enterprises like the ING, the Dutch financial conglomerate establish a committee which comprises of senior management individuals to deal with ICT issues and ensuring that ICT is fulfilling the organisation objectives. CIO is found to be included in the committee in some organisations such as Dow Corning, a silicon manufacturer which indicates that business is recognising the value of ICT in the organisation. This also encourages the linkage between the ICT strategy and the business strategy in achieving the objectives of the organisation.

According to study by Weill and Ross, ninety percent of organisations demonstrate the involvement of senior executive committee in ICTG in which various members of the committee are drawn from all departments in the organisation. This is a good example of federal archetype structure and it shows the importance of having all the inputs from various sectors of the organisation involve in making ICT decisions. Moreover, ICT monarchy archetype structure is adopted by the Old Mutual South Africa organisation whereby business units

CIOs who report to the top CIO can make all key ICT decisions except for investment decisions. Similarly, Campbell Soup organisation establishes an ICT leadership team which consists of ICT specialists to advice Campbell's Architecture Review Board on ICT architecture issues to ensure that proposed projects are conformed to architecture standards and meet with business objectives.

Similarly, De Haes and Van Grembergen (2005) find that CIO is having the same direct reporting line to the Executive Committee with the other directors of other departments in KBC, a major Belgian financial services organisation such as the KBC Bank and KBC Assurance. The Executive Committee is reported directly to the Board of Directors. It is also found that CIO is not a member of the Executive Committee but he is reported directly to the committee and invited to attend the committee's meeting frequently. In this way, it improves the alignment between the business strategy and ICT strategy. In addition, an ICT committee which consists of the CIO and some members of the Board of Directors is formed to focus on developing and reviewing ICT strategy to make sure that it is supporting KBC objectives.

2.5.2 Processes

The ICTG processes focus area focuses on the actions taken to deliver the decisions made in ICTG structure. It also focuses on the initiation, development, and maintenance of ICTG decisions (De Haes and Van Grembergen, 2005). This is also known as 'alignment processes' according to Weill and Ross (2004). Alignment processes focuses on who and how to provide inputs into the ICTG decisions and who and how to propagate the outputs of ICTG decisions. For example, for an ICT investment project to get approval it has to go through the investment committee to determine the impact of this ICT investment project on the organisation. The main tasks of the investment committee are to investigate the return benefits of the organisation from this investment, availability of resources, and readiness of the organisation to implement this project (Weill and Ross, 2004).

Similarly, the study by De Haes and Van Grembergen (2005) find that the processes for implementing a new project at KBC, follow in the following order by initiating a new project first, then validate the idea, prioritise projects, seek

funding and approval, develop the project, and then support the project. A new idea or project can be initiated by business divisions depending on the information catered from various business divisions. The new project gets submitted to a consultative committee to validate the idea. After that then the new project gets submitted to an ICT/Business steering committee to prioritise projects before submitting it to the executive committee for funding and endorsement. Once it is endorsed by the executive committee, the new project is submitted to a management steering committee to develop and implement the project. At the end, the project is then submitted to the management operational systems committee to maintain and support the project.

In addition, Project tracking is another one of the process mechanisms whereby tools are used to keep track of implemented projects in the organisation to ensure that projects are on schedule and within the allocated budget. Weill and Ross (2004) report that 90 percent of enterprises in their study keep track of consumed resources in ICT projects. Similarly, some enterprises use CMM to keep track of ICT projects while others develop their own project management tools. In contrast, De Haes and Van Grembergen (2005) state that CMM should be used to determine the stage where the organisation is at in ICTG and identify improvements to enhance the ICTG of the organisation. De Haes and Van Grembergen also suggest using Balance Scorecard as a performance management tool to keep track the performance of ICT projects and ensure that ICT projects meet the business objectives.

Furthermore, formal tracking of business value is another process mechanism in ensuring that business objectives are achieved. This process keeps track of the value the organisation receives from ICT. Weill and Ross (2004) find in their study that 60 percent of enterprises formally track business value in ICT initiatives. This process also helps business and ICT executives to identify sources or barriers in generating value from ICT investments.

Given the above, it is found that in ICTG implementation process, there are quite a few sub committees under the executive committee to assist with making decision, implementing ICT projects, and making sure that ICT initiatives are supporting business goals. Processes may vary from one organisation to another depending on the mechanism used by that particular organisation for implementing ICTG.

2.5.3 Communications

By having only the ICTG structures and processes are not sufficient to implement a good ICTG in an organisation as the link between ICT and business will still be detached for they do not understand each other. However, the purpose of the ICTG communication focus area is to make sure that appropriate communication mechanisms are in placed to propagate the ICTG decisions and processes identified in ICTG throughout ICT and the organisation so that they both have a common understanding on ICT issues. By doing so, the organisation is confident that the strategies initiated from ICT are supporting the business goals and objectives.

Weill and Ross (2004) suggest using of senior management announcement as an effective mechanism for communicating ICTG decisions and processes. Senior management announcement prioritises and commits ICT initiatives and attracting a lot of attention in the organisation. For example, Weill and Ross report that Dow Corning Company announces that the implementation of its two years Enterprise Resource Planning (ERP) becomes its top priority for that period leaving the rest of ICT initiatives to be deferred. Likewise, Delta Air Lines commits to redeveloping of its airline operations infrastructure and customer experience and deferring all the other commitments.

Formal committee is another communication mechanism suggested by Weill and Ross (2004). Formal committee is usually established to carry out governance decisions and responsibilities. Projects are often relying on committees of stakeholders to define its requirement, monitor its progress, and identify potential issues. For example, according to study by De Haes and Van Grembergen (2005), there exists a domain consultative committee to verify new ICT projects initiated from businesses known as, another committee to prioritise projects which is the ICT/Business steering committee, the executive committee to endorse projects and approve funding of projects, program management steering committee to implement projects, and management operational systems committee to maintain the projects.

Furthermore, training and educating organisation members on ICTG processes are part of ICTG communication and there are various mechanisms to conduct this. Weill and Ross (2004) suggest the use of web-based portal as the main communication channel in providing ICTG information in many

organisations. Announcements and updates can be published through this portal. Some portals provide templates for ICT investment projects whereas others use portals to display procedures on how to order software and hardware. According to Weill and Ross study, it is found that 90 percent of enterprises use portals to communicate ICT governance and thereby improving governance transparency by making the enterprise policies, standards, and performances available to organisational members.

Similarly, De Haes and Van Grembergen (2005) find that KBC Company uses internal magazines and intranet site to display information to the organisational members on ICTG such as the governance model, roles and responsibilities, established governance committees, and templates. In this way, the shared understanding between the business and ICT will be rapidly improved leading to successful implementation of ICTG.

2.6 Guidance for ICTG implementation

There are many different ways of implementing ICTG in the organisation and some of the practices are found in the literature as guidance for implementing ICTG in an organisation. Brand and Boonen (2005) argue that guidelines for implementing ICTG will vary from one organisation to another depending on the circumstances of that particular organisation. They suggest that one way of implementing ICTG is to begin by assessing the ICTG maturity level of the organisation by adopting the COBIT CMM. By walking through the organisation in the COBIT CMM processes, identify the differences and suggest possible improvements to enhance ICTG implementation in the organisation.

In addition, another approach for implementing ICTG in the organisation which is to assess the relationship between business goals, ICT goals, and ICT processes to ensure that ICT processes in place support its ICT goals and as well as achieving a business goal (Brand & Boonen, 2005). This can be done by first identifying a business goal and then determine the related ICT goals and processes to achieve this business goal. By doing this, identify any gaps and recommend possible improvements to enhance ICTG implementation in the organisation.

Furthermore, COBIT for small and medium enterprises which is so called 'COBIT Quickstart' is a software program that can speed up the implementation of ICTG in an organisation. Brand and Boonen (2005) suggest reviewing the

COBIT Quickstart processes and identifying the weakest ones and begin the enhancement process with three of the selected processes.

The process of implementing ICTG in an organisation is not an easy task and it will go through various phases before it completes. This process will take a long time depending on the circumstances and risks that will involve in the organisation. Some risks may relate to organisational change whereby employees have to learn new ways of working and resistance to change from employees. However, the implementation processes should be managed through a project. Brand and Boonen (2005) suggest the following project guidelines for ICTG implementation. Firstly, identify the requirement of the organisation for ICTG through analysing business and ICT goals, identify processes and controls, and examine risks. Next, visualise a solution by defining the actual performance and target for improvement, and identify the gaps and recommend the improvements. After that then plan the solution by defining projects and develop improvement plan. Subsequently, implement the solution by implementing the recommended improvements and incorporate measurements to measure the ICTG performance and also develop a post implementation review. Lastly, develop a sustainability plan by developing an ICTG structure and processes..

2.7 Factors influencing ICTG implementation

From the literature, it is evident that there are some factors that influence the implementation of ICTG in an organisation. These factors are classified into two categories which are enablers and inhibitors. According to a survey by Luftman et al. (1999), the following enablers and inhibitors in business-ICT alignment are shown in table 2.1.

Enablers	Inhibitors
Senior executive support for ICT	ICT/business lack close relationships
ICT involved in strategy development	ICT does not prioritize well
ICT understands the business	ICT fails to meet its commitments
Business – ICT partnership	ICT does not understand business
Well-prioritized ICT projects	Senior executives do not support ICT
ICT demonstrates leadership	ICT management lacks leadership

Table 2. 1: Enablers and Inhibitors in Business-ICT Alignment

(Source: Adapted from Luftman et al., 1999, p.4)

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Most of the issues in table 2.1 are related to the management aspect of the organisation with fewer concerns on the possible factors from social, technical, economical, cultural, and political aspects of the organisation.

Gottschalk (1999, cited in Lee et al., 2008) agrees that there are enablers for implementing ICTG in the organisation as follows: having a good understanding of the business and business processes, ensures that adequate financial support and human resources are available, sufficient time to conduct the project, and a skilled and dedicated person to champion the project.

In addition, McLeod and Smith (2006, cited in Lee et al., 2008) identify two enablers to implementation of ICTG which are ICTG training and external support. ICTG training is required to provide training to those who will conduct the implementation of ICTG in the organisation. The organisation should ensure that adequate staff are engaged in the ICTG project to minimise disruptions such as a staff member in the project being absent. On the other hand, external support should be considered such as consultants and vendors that may be required during the implementation of ICTG. Independent views and second opinions are good strategies as well.

Furthermore, Gichoya (2005) emphasizes that drivers and enablers are factors that encourage the successful implementation of ICT projects which can be applied to ICTG implementation project. Driver factors may include a defined vision and well planned strategy, acquire the support of the government and external donors, rising consumer expectation, and technological change, modernization and globalization. In addition, enabler factors may include effective project, coordination and change management, and sound practice.

In contrast, factors that may cause the implementation of ICT projects to fail should also be considered. Gichoya (2005) emphasizes the barriers and inhibitors that lead to failure of ICTG project. Such barrier factors may include inappropriate infrastructure, inadequate financial support, poor data systems and lack of systems compatibility, lack of skilled personnel, poor leadership, and negative attitudes. In addition, inhibitor factors may include user needs, technology, coordination, ICT policy, transfer of ICT idolizers, and donor push.

Moreover, Lee et al. (2008) suggest five major governance inhibitors in ICT strategy and management from a survey of 96 leading enterprises in Korea that affect the success of ICTG implementation in an organisation. These five

inhibitors are lack of communication between ICT and stakeholders, inadequate stakeholders' involvement, lack of clear ICTG principle/policy, lack of clear ICTG processes, and inadequate support of financial resources. Again, Lee et al. have not addressed the technical, cultural, and political factors that affect the success of ICTG.

2.8 Conclusion

In conclusion, this chapter provides clear understanding of the differences between EG and ICTG in terms of their structure, roles and responsibilities in the organisation and how ICTG can fit in within the EG structure. It is found that ICTG is an integral component of EG whereby ICTG should be addressed at the same level with corporate governance and business governance of the organisation. This chapter further outlines some of the frameworks used in ICTG such as the COBIT, Val IT, ITIL, and the COBIT CMM. The COBIT framework was developed by ITGI and its prime focus is on the execution and delivery of ICT-enabled business investments of the organisation. To do this, the COBIT framework provides a process model that could deliver those ICT-enabled business investments to achieve ICT goals as well as business goals. On the other hand, the Val IT framework is a subset of the COBIT framework which was developed recently by ITGI with the focus on the investment decisions and realisation of benefits from ICT-enabled business investments by the business. To obtain this, the Val IT framework provides guidelines, processes, and supporting practices to assist executive management and related authorities in the organisation in carrying out their roles related to such ICT-enabled business investments. Moreover, the ITIL framework provides guidelines and best practices for the ICT service management to help improving customer satisfaction, enterprise productivity, the use of skills and experience, ICT services through the use of best practice processes, and reducing costs. In contrast, the COBIT CMM is a model for assessing the maturity level of ICTG processes in the organisation. The COBIT CMM consists of six levels of maturity.

The deployment of the ICTG frameworks in ICTG implementation is the challenging step. However, ICTG implementation can be deployed through a mixture of various structures, processes, and communications mechanisms as shown in the ICTG implementation framework presented in figure 2.4 based on

the studies done by Van Grembergen and De Haes and Weill and Ross. These mechanisms are the main focus areas in ICTG. The structure focus area focuses on structure of the organisation and identifying the decision makers in ICTG. For example are the centralised and decentralised approach to structuring of ICT department in the organisation presented by Broadbent and Kitzis (2005) and the six archetypes presented by Weill and Ross (2004). The processes focus area focuses on the mechanisms in placed to ensure that ICT is supporting and meeting the objectives of the organisation such as the processes for implementing a new project at KBC presented by De Haes and Van Grembergen (2005). The communications focus area focuses on the mechanisms in placed to ensure that ICT is properly communicated throughout the organisation such as trainings, formal committee, portal, internal magazines, and intranet.

This chapter also identifies some guidance for the implementation of ICTG in the organisation. The first guidance is the use of COBIT CMM prior to implementing ICTG to assess the status ICTG in the organisation. The second guidance is to assess and link ICT goals and processes to business goals. The third guidance is to use the 'COBIT Quickstart' software program for the implementation of ICTG. The fourth guidance is to treat ICTG implementation as a project by going through the project phases which consists of requirement analysis of ICTG and identifying business and ICT goals, design a solution for improvement, plan and develop the solution for the improvement, implement the solution, and maintain the solution.

Lastly, some factors that influence implementation of ICTG in the organisation are also identified in this chapter. Interestingly, these factors are classified into two categories which are the enablers and inhibitors. The enablers are the factors that help improving the ICTG implementation in the organisation such as senior executive support ICT, ICT involved in strategy development, and adequate financial and human resources available. On the other hand, the inhibitors are the factors that hamper the improvement of ICTG implementation in the organisation such as ICT/business lack of close relationships, senior executives do not support ICT, inadequate financial support, and lack of communication between ICT and stakeholders of the organisation. These identified enabler and inhibitor factors should be considered and managed while implementing ICTG in the organisation.

Chapter 3
Methodology

3.1 Introduction

In Chapter 2, the relevant literature was reviewed and a framework for ICTG implementation was presented in figure 2.4. ICTG can be implemented through a mixture of mechanisms within the following three focus areas: structures, processes, and communications. The literature reviewed also identifies challenges and issues that have arisen in the relationship of ICT and business. One of the key areas identified is the implementation of management practices, the effects of implementation and the governance of these processes. The intensity of concern found in the literature for best practice and the mitigation of organisational risk together with the motivation of the research identified in Chapter 1 have lead to the framing of the research question.

The main research question for the research is: What are the factors that influence ICTG implementation? In addition, the following sub questions are derived from the main research questions to further specify the context and the causal connections between variables. These sub questions are: How does the organisation implement ICTG? What are the causes of these factors? and What is the relationship between these factors and ICTG?

Chapter 3 is concerned with developing a methodology to answer the research question. The nature of organisations and the dynamic nature of Governance suggest that exploratory research from a qualitative paradigm would provide a broad base to start an investigation. According to Collis and Hussey (2003), the purpose of exploratory research is to look for ideas or hypothesis instead of testing a hypothesis. The exploratory research focuses on gaining insights and familiarity with the research area in order to conduct further rigorous research in the future. The methods used for exploratory research are case study, observation, and historic data which can provide both quantitative and qualitative data.

Chapter 3 is structured to review previous studies that identify what others have done to research similar questions. From the learning in section 3.2 a description and specification of a plausible research design is elaborated in section 3.3. Section 3.4 then justifies the adoption of a preferred methodology, including

the reason for choosing the methodology over other methodologies detailed in sub section 3.4.1. In section 3.5, the reasons for selecting the case organisation is discussed. Various relevant methods for data collection are identified and described in section 3.6. Methods for analysis are identified and defined in section 3.7. A conclusion is then stated in section 3.8.

3.2 Review of Similar Studies' Methodologies

Other research on ICTG prefers the use of case study methodology which involves interviews and document collection for data collection. For example, De Haes and Van Grembergen (2005) conducted a case study at KBC, a major Belgian financial group that employed a qualitative approach through face-to-face in-depth interviews of CIO and business representatives to find out how an organisation could implement ICTG through a mixture of structures, processes, and relational mechanisms to achieve IT/business alignment. The interviews were tape recorded for analysis later after the interviews. In addition, data from other reports such as internal reports and presentations by CIO were collected for analysis as well.

Luftman et al. (1999) conducted a research to find out the enablers and inhibitors of business-IT alignment which utilised a survey including interviews and observations on executives from 500 firms representing 15 industries who attended classes at IBM's Advanced Business Institute. The research results were then analysed quantitatively using statistical analysis, graphs, and tables.

Lee et al. (2008) conducted a research to find out the causal relationship between ICTG inhibitors and its success in Korea enterprises. Lee et al. used a scientific approach whereby a literature review was first carried out to find out the existing factors and then hypothesis were drawn from the literature to conduct the research. There were five factors identified from the literature that restrained ICTG implementation. Lee et al. then collected survey data from 96 leading companies in Korea on the status of ICTG practices. The data gathered from the survey were analysed quantitatively to test the hypothesis.

3.3 Research Design

The representative studies on ICTG reviewed in section 3.2 above show that most of the study in ICTG employs either a case study or a survey method. According

to Collis and Hussey (2003), case study methodology is more a qualitative approach whereas survey is more a quantitative approach. The case study methodology can allow greater insights and information on factors influencing ICTG implementation in context. The methods include unstructured interviews, documents collection, and diary recording. According to Benbasat, Goldstein, and Mead (1987, cited in De Haes & Van Grembergen, 2005), case study methodology is suitable for research in ICT fields because researchers always fall behind practitioners in ICT fields in finding out new methods and ideas.

In addition, case study methodology is suitable for the research due to limitation in financial resources and time to conduct the research. The scope and methods for the research are also reduced to complete the research within the limited time frame which is only six months. The survey method used in some of the research identified in section 3.2 can take the author's time and effort to conduct a pilot test of the questionnaire first and then try to get reasonable sample for the survey from the case organisation. Given that the case organisation is located overseas makes the survey approach difficult as well. To conduct survey through telephone can be very expensive and the response rate may be low. To collect the questionnaires from participants can be another challenge due to uncertainties of the committed participants to the survey and the quality of the responses.

Therefore, the author proposes to conduct an exploratory research through a single case study at the Ministry to find out factors that influence ICTG implementation in order to develop good practices for practitioners in ICTG. Therefore, a qualitative approach with a single case study may bridge the gap of previous studies by revealing concepts in relation to factors influencing ICTG implementation from various dimensions of the case organisation. Given the ICTG implementation framework presented in chapter 2, the author would like to conduct the research in the Ministry by firstly, finding out how ICTG is implemented in the organisation within the ICTG implementation framework presented in chapter 2 and then secondly, investigating factors that influence implementation of ICTG in the Ministry. The research should be concentrated on identifying factors from all aspects of the organisation such as management, technological, economical, and social. Thirdly, investigate the causes of these factors and then lastly, investigate the relationship between factors influencing

ICTG implementation and ICTG. Despite the fact that some of the previous studies use quantitative approaches, the author believes that factors which may arise that influence ICTG implementation are subjective to various aspects of the organisation such as management, technological, economical, and social. A quantitative approach would be too difficult to manage with in the 14 week time frame and the context.

The methods for data collection usually involve unstructured interviews, document collection, and diary recording. The unstructured interviews are carried out with representative participants from the executive level, the management level, and the ICT division. The unstructured interviews can be conducted in language the participants are most comfortable to use. The author believes that participants can be more comfortable communicating in their mother tongue language. The interviews can be recorded on a digital voice recorder. All relevant documents such as organisation structure chart, policies, and procedures can also be collected for validating of the interviews. A diary can also be used to record daily activities related to ICTG implementation.

The methods for analysis can involve transcribing, translating, and employing thematic analysis to analyse interviewees and documents. The interviews can be transcribed in the actual interview language. The transcribed interviews can then be translated into English language for analysis. The author can make sure that meaning and ideas are sustained after translation.

The research data map in figure 3.1 shows how the research questions are mapped to data collection methods and then to the data analysis method. The data can then be analysed and mapped to research findings to provide answers to the research questions. The implication of the research is stated and then mapped to recommendations for future research.

Research Data Map

Research Question	What are factors influencing ICT Governance implementation in the organisation?
Research Sub-Questions	What are the causes of factors? · What is the relationship between factors and ICTG? · How is ICTG implemented in the organisation?
Data Sources	Diary · Documents · Unstructured Interviews
Interview Questions	Interview Starters identified in section 3.6.1.3
Data Analysis	Thematic analysis using NVivo version 8 software
Research Findings	Mechanisms for ICTG implementation · Factors influencing ICTG implementation
Recommendation	Recommend Practices for ICTG implementation
Future Research	How effective are the recommended practices in ICTG implementation? · What are the impacts of factors in ICTG implementation?

Figure 3. 1: Research Data Map

(Source: Author, 2009)

3.4 Case Study Methodology

The interpretive perspective gives the author a belief that reality of the researched subject is subjective to its context. In other words, the social and physical experiences of people in the studied context are investigated (Cavana, Delahaye, & Sekaran, 2001; Collis & Hussey, 2003). Hence, case study is the chosen methodology for the exploratory research. Case study can be defined as the intensive study of a single case where the purpose of the study is to be able to generalize a theory to a population of cases (Gerring, 2007). According to Yin (2003, cited in Dul & Hak, 2008),

> *"a case study is an empirical enquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between object of study and context are not clearly evident"*.

Similarly, Collis and Hussey (2003) define case study to be an extensive study of a single instance of a phenomenon of interest. Collis and Hussey also refer case study as an exploratory research. Dul and Hak (2008) simplifies the definition of case study to be a study of a single case or multiple cases in its real life situation and analyze data that are obtained from these cases qualitatively. Case study is an example of qualitative methodology from an interpretive paradigm. Case refers to an individual which can be a group, family, class, office, institution, industry, or profession (Gillham, 2000). Yin (1994, cited in Collin and Hussey, 2003) identifies the following characteristics of case study research: to explore certain phenomena and understand them within a particular context; to conduct the research without a preset of questions and notions about the limits within which the study can take place; and to use multiple methods for collecting data which can be both qualitative and quantitative.

However, for the purpose of the exploratory research, a single case study is adopted which can be conducted at the Ministry. The collected data can then be analysed in a qualitative manner. Although the author has identified potential factors that may influence the implementation of ICTG in the organisation in chapter 2, the author cannot set any preset rules or questions to control the answers from participants while conducting the research. Instead, the author can try to collect as many information as possible from various aspects of the organisation in relation to ICTG. In doing so, the data collected can be more qualitative and rich in meanings.

3.4.1 Reasons for selecting Case Study over other Research Methodologies

Given the reasons described in sections 3.1 and 3.3, the author believes from an interpretive paradigm that case study is again the suitable approach for the exploratory research. Although other methodologies in qualitative research have also been considered such as grounded theory, action research, and ethnographic research, case study is still the suitable methodology for the research. The reason for this is because the objective of grounded theory is to generate or formulate a theory or theories about a phenomenon from the collected data according to Collis and Hussey (2003). The main data collection method for grounded theory is observation in which observation is not required in the research. In addition, the objective of the research is not purely theory formulation but instead, the research adopts analysis method from grounded theory for analysing the collected qualitative data to identify factors that influence ICTG implementation and to develop good practices for ICTG implementation. Research using grounded theory can also require longer period of time of at least one year.

Furthermore, both ethnographic and action research are methodologies for conducting qualitative research in a longer period like more than one year for data collection. Hence, these two methodologies are not suitable for this research for this research requires only six months. According to Collis and Hussey (2003), ethnography is a method that allows the research to fully involve in the case of study in socialising and sharing knowledge with participants to understand and observe patterns of human activities. Eriksson and Kovalainen (2008) argue that ethnography is the methodology for studying cultures and cultural sense-making. Sense-making refers to normal daily practices that the researcher is used to understand the case organisation's surroundings. The objective of ethnography is to enable the researcher and participants to have a common understanding and interpretation of that world. The main data collection method for ethnography is participant observation where the researcher is directly involved in the case organisation.

Moreover, action research methodology is used to develop changes as improvement to the case of study and monitor its progress (Collis and Hussey, 2003). Sometimes action research can be referred to as a problem solving methodology. The main data collection method of action research is participant observation whereby the researcher is collaborating with participants in the case

organisation in developing solution as improvement to the case organisation (Eriksson & Kovalainen, 2008). Thus, action research is not necessary for this research.

Given the above, it is therefore, recommended that case study is the suitable methodology for the exploratory research which enables the author to explore the implementation of ICTG in the case organisation in depth and finding out the factors that influence ICTG implementation in the organisation so that good practices can be developed for implementing effective ICTG.

3.5 Reason for the Case selection

Initially, the author was thinking of conducting the research in an organisation in Auckland, New Zealand that may minimize the cost and time of travelling overseas. Unfortunately, the author's supervisor advised the author that it would be very difficult to obtain access to an organisation in New Zealand. The process of obtaining access to an organisation would take months which would involve getting approval from higher authorities outside AUT University authority and sorting out ethical issues and agreement. Thus, the author's supervisor advised the author if it is possible for the author to get access to an organisation in the author's home country, Tonga and the author replied positively.

For that reason, the author liaised with the Ministry and received positive support from the Ministry. Due to the fact that the author knows some of the people in the Ministry, getting access to the Ministry cannot be too difficult. From the author's perspective, the Ministry houses the latest and arguably the best state of the art ICT systems amongst the government organisations in Tonga in terms of staff, networking systems, computer systems, and software systems. The author would also like to conduct this research as contribution to the development of Tonga.

3.6 Data Collection Methods

There are three main data collection methods adopted in the research which is the unstructured interview, document collection, and diary recording. According to Collin and Hussey (2003), interview and archive searching are common data collection methods for case studies. Sub section 3.6.1 describes the unstructured

interview method whereas document collection method is described in sub section 3.6.2. Sub section 3.6.3 describes the diary recording method.

3.6.1 Unstructured Interview

The unstructured interview can be conducted with the potential participants from the Ministry. Collis and Hussey (2003) state that unstructured interview is likely to use open-ended probes to explore participant's responses in more depth. The unstructured interviews allow the interviewees to talk freely and openly on the research topic together with some guidance from the author. Collin and Hussey also suggest that the unstructured interview is a good approach to collect qualitative data which are rich in details and descriptions. Gillham (2000) also agrees that the benefit of interview is that it provides the 'richness' in communication. According to Eriksson and Kovalainen (2008), unstructured interview allows the researcher to get more insights information from the participants that cannot be anticipated. Thus, the researcher should have good interpersonal skills to be successful in conducting the interview. Similarly, Arksey and Knight (1999) state that unstructured interview can reveal and explore the meanings from people perspective that underpin their lives, routines, behaviours, feelings and so on.

Furthermore, interview can be used when number of people involved in the research is small, participants are accessible, participants are critical to the research, open questions are used, and information may be easily disclosed in a face-to-face interview (Gillham, 2000). Eriksson and Kovalainen (2008) also agree that unstructured interview should not employ any formal or structured questions but instead, allow the conversation during the interview to move freely in any direction of interest that may arise. Moreover, Easterby-Smith, Thorpe and Lowe (1991, cited in Collis & Hussey, 2003) suggest that unstructured interview is appropriate to generate good understanding of the subject's world with the interaction of the research, no specific logic exists in the situation, and where the subject matter is very confidential or commercially sensitive.

Therefore the objective of unstructured interview is to allow participants to provide a lot of information on the research topic without the control of the researcher. However, it is the task of the researcher during analysis to organise and categorise the collected information from the interview. As a result, the

answers for the research questions can be found and new theories may also be elevated.

Prior to conducting an unstructured interview, it is important to be prepared. In terms of preparedness, there are four main components involve in an interview which are the selection interview participants, preparation for the interviews, conducting the interviews, and recording the interviews. Follows provide guidelines for selecting interview participants, preparing for the interviews, conducting the interviews, and recording the interviews.

The following sub sections will describe the sampling of interview participants in sub section 3.6.1.1, preparing for the interviews in sub section 3.6.1.2, and conducting the interviews in sub section 3.6.1.3.

3.6.1.1 Sampling of Participants

The target population of the research is the executive management members and ICT senior staff in the Ministry. However, the research is aiming to interview a sample group which consists of eight participants which can be selected from various divisions in the Ministry such as treasury, ICT, and economics. The selection of participants can largely depend on their role in the organisation in relation to ICTG and also their availability for the interview. The participation of participants can be completely voluntarily but eight are expected to be interviewed. The example of possible participants would be the head of the economic division, head of ICT division, and head of treasury division. One may argue that this sampling method is bias but from the perspective of the author, these are the participants with relevant role, skills and knowledge that could contribute with rich data into the research. The selection of participants can also be determined by availability and other practical matters in the field.

3.6.1.2 Preparing for the Interviews

According to Gillham (2000), there are three main elements of interview preparation which are practicing interview, develop interview topics and questions, and rehearse the interview. Firstly, it is imperative to practice the interview before conducting the actual interview to ensure that the author is familiar with the key topics, prompts, and probes. Moreover, practicing the

interview can ensure that the interview process can flow and maintain the focus on the research topic.

Secondly is to develop and focus the interview topics. To do this, Gillham (2000) suggests that the author should identify some key topics or so called 'starters' to be asked, framing the questions to be around five questions, and making sure that questions are open where interviewees are expected to provide the answers. The author should also decide on suitable prompts to remind interviewee about a particular topic and use probes where necessary to allow the interviewees to provide more information on a topic. Moreover, the interviews should be recorded by writing some useful notes on diary and recording on tape (Collis & Hussey, 2003). The tape recording is much preferable because it is more convenience and less disruption during the interview. In this research, a digital voice recorder can be utilised to record the actual interviews instead of the traditional tape recording device. All interviews can be stored in digital format in the digital voice recorder and can be downloaded into the author's computer for transcription ad analysis. The tape recording can allow the author to listen to the interviews more than once and can analyse the interviews thoroughly. The writing of notes during interviews may distract the interviews and interrupt the flow of the interview as well.

Lastly is to make sure that the interview is rehearsed before conducting the actual interview.

3.6.1.3 Conducting the Interviews

Prior to conducting the actual interviews, it is important to consider the atmosphere of the venue where the interview can take place to make sure that the interviews can be heard and the recording during the interviews are not disrupted as well. Gillham (2000) suggests that noise should be considered to be very limited. Some comfortable chairs should be in placed for the interviewees. It can be necessary to have a table in placed for the digital recorder and for the author's note taking. Some appropriate drinks should also be made available during the interviews like coffee or soft drinks. The telephones and mobile phones should be switched off during the interviews. Alternatively, the interview should be conducted in a place outside the case organisation to avoid disturbance from work.

In addition, Arksey and Knight (1999) suggest conducting the interviews in the interviewees' own language. In doing so, it can avoid the author from imposing any restriction through language and allowing the interviewees to communicate freely and confidently. Arksey and Knight also suggest using critical listening whereby the author is required to pay attention to words being said by the interviewees on how they are being said and any emphasis or emotional tone that may appear. Arksey and Knight suggest to look for some key words during the interviews which may help with the author's probes and flow of the interviews. At the beginning of the interview, it is suggested for the author to be friendly, polite and open. Introduce yourself and introduce the research topic and its potential benefits and also indicate that the interviewee's comments can be valuable for the research. Try to avoid imposing any sense of urgency or impatience that may disrupt the interviews. At the end of the interview, express thanks to the interviewee for participating in the research.

To conduct the actual interview, the author should first welcome the interviewee follows by explaining the purpose and possible outcome of the research according to Arksey and Knight (1999). After that, the author should then allow the interviewee to start talking openly by guiding him through the 'starters'. Make sure that prompts and probes are used appropriately during the interview to gain more information on 'starters'. Eriksson and Kovalainen (2008) suggest using open questions like 'Tell me about your professional career' to encourage participants to talk more openly during the interviews. Eriksson and Kovalainen also suggest using simple question like 'How did the Minister react' rather then complex ones such as 'Can you describe to me the details, opportunities, problems, and consequences of ICT implementation'. It is easier for participants to answer simple questions than complex ones. However, the author prepares the following questions as interview 'starters' for the actual interviews:

- Tell me about your role in the organisation;
- Tell me about your experience with ICT Governance;
- Tell me about your role in relation to ICT Governance;
- Tell me about the things that make ICT Governance work here;
- If you had to address an audience of experts about your experience, what would you tell them not to do in ICT Governance; and

- Tell me the best possible outcomes for ICT Governance.

3.6.1.4 Recording the Interviews

Eriksson and Kovalainen (2008) state that although there are many ways to record interviews such as note taking during the interview and note taking after the interview but the preferred way is tape recording the interview. The videotaping can also be used as another useful method for recording interviews but the equipment is much more expensive than a tape recorder. The note taking during the interview may disrupt the interview while note taking after the interview may also loose some of the important issues identified during the interview. However, this research recommends using tape recording for the interviews. To do this, a digital voice recorder can be borrowed from that AUT University for recording the interviews instead of the traditional tape recorder. The digital voice recorder does not require tapes but instead, store interview data of up to 300 hours of interviews in its internal storage device. This feature avoids concerns about storing and sorting of tapes in case the tapes are damaged or misplaced. The digital voice recorder should have the capability to play, pause, rewind, and fast forward which can be used when required. The author can just press play button at the start of the interview and pause the recorder for morning tea or if the interviewee is excused to attend a meeting or urgent matter. The rewind and fast forward features can be utilised to listen to interviews more than once for better interview analysis and generating more interview points.

The digital voice recorder should be placed appropriately so that the device can record the conversation of the participant and the author during the interview clearly. For example, the digital voice recorder can be placed on a table between the participant and interviewer and within appropriate distance from both.

The interview recordings can be coded (A, B, … n) and downloaded to the author's computer for storage and ready for data analysis. The downloaded files in the author's computer can also be treated as primary backup and it can also be copied to CDs or memory stick as secondary source of backups. The digital voice recorder and backup disks can be kept in a safe and secure place during the research.

3.6.2 Documents Collection

The interviews alone are not sufficient for data collection. However, relevant documents to the research from the case can be requested for copies and collected for analysis and can also be used to verify and clarify the responses from participants. The documents can also be collected as evidence for the research. The examples of relevant documents such as documents on the case organisational structure, roles description, corporate strategy plan, ICT strategy plan, and ICT policy. The documents can be sorted by category of similar aspect such as organisation structure and ICT policy and ready for analysis.

3.6.3 Diary Recording

Collis and Hussey (2003) state that diary recording is a good method for collecting qualitative data. Diary is a book which can be used by the author to record daily events or issues that may arise during the research in relation to what people do, think and feel which may contribute to the research. The diary may also be used to record informal conversations with some of the staff such as staff from the ICT division of the case organisation.

3.7 Analysis

After collecting data from the interviews, document collections, and diary recordings, these data can then be analysed rigorously to find out answers for the research questions and also develop good practices for the implementation of ICTG. Sub section 3.7.1 describes the processes and methods involve in analysing of interviews. Sub section 3.7.2 describes the processes and methods involve in analysing documents and diary recordings.

3.7.1 Interview Analysis

There are three main steps involve in analysing unstructured interviews which are the transcription of the interviews, translation of the interviews, and analysis the interviews using thematic analysis. These steps are described in details in the next sections. Sub section 3.7.1.1 describes the process of transcribing interviews while the process of translating transcribed interviews are described in sub section 3.7.1.2. Sub section 3.7.1.3 describes the use of thematic analysis method for analysing interviews.

3.7.1.1 Transcribing the Interviews

The interview transcription can be employed to convert all recorded interviews from digital audio format into textual format to enable the author to perform analysis on the interviews data. Gillham (2000) advises that it is very important to transcribe the interview straight after the actual interview while the author still remembers the information from the interviews. This is the reason why tape recording is highly recommended so that interviews can be replayed many times to capture all aspects from the interviews. The author predicts that responses from interviewees can be mostly in Tongan language. However, the transcription can be done in two phases. Phase one is the transcription of the actual interviews which is expected to be mostly in Tongan language and phase two is the translation of the transcribed interviews into English language. In phase one, the author can transcribe the actual interviews by playing the interview recording while transcribing it in the actual interviewing language. The transcription process can be assisted by the software called 'Digital Voice Recorder version 3.1. The recorded interviews can be downloaded into the author's computer and then played using the Digital Voice Recorder software. The Digital Voice Recorder software allows the author to play, rewind, or adjust the speed of the interviews so that the author can listen to the interviews clearly and transcribe at the same time. During transcription, the author can identify the interviewee and record the detail of his talks on the transcribing software called 'Microsoft Notepad'. This process can be done for each interview and saving each interview transcript into a computer file in the author's computer and naming each file with appropriate filenames.

3.7.1.2 Translating the Interviews

In phase two, the author can translate the transcribed interviews from its actual language into English language because English is the standard required language for academic research at the AUT University. The translation can not necessary be done word by word but the whole sentence can be considered in terms of its meaning and context before translating it into its appropriate English version. This is due to limitation in Tongan vocabulary in comparison to English in which a single Tongan word may refer to different meanings or can be translated into more than a single English word or vice versa. For example, the Tongan word

''aho' may mean in English as day light, day of the week, or name of a person. The Tongan words 'moloki' means 'walk over' or 'run over' in English. In addition, the English words 'I understand' means ''Oku mahino kiate au' in Tongan. The translation can be based largely on the author's knowledge and understanding of his native language.

3.7.1.3 Thematic Analysis

The thematic analysis method can be employed as the main tool for data analysis of the research which can be used for analyzing data from interviews. According to Braun and Clarke (2006), thematic analysis is a method for identifying and analyzing themes in the data. Although thematic analysis is not widely mentioned, but it is an analysis method that is widely used (Boyatzis, 1998; Roulston, 2001, cited in Braun & Clarke, 2006). Boyatzis argues that thematic analysis is a tool that can be used across different methods. Ryan and Bernard (2000, cited in Braun & Clarke, 2006) state that thematic coding is a process that is used within grounded theory, a qualitative methodology. However, according to Braun and Clarke, some of the methods used in research like content analysis and grounded theory are mostly thematic but they are not called thematic analysis. Braun and Clarke argue that thematic analysis should be a separate analysis method. The flexibility of thematic analysis contributes to the richness of its analysis.

Therefore, Gillham (2000) suggests some useful steps found in content analysis but they are similar to the objective of thematic analysis given that there are no specific rules for thematic analysis according to Braun and Clarke. These steps begin by taking each transcript in turn and go through each one and highlight substantive statements that make a point. Next, ignore repetitions, digressions, and other irrelevant statements and highlight similar statements if they stand out to make a point. It is a good practice to take a break frequently when necessary to stay motivated instead of becoming dulled. Next, revise the transcripts and the highlighted statements again to ensure that nothing important is missed. Review the transcripts and assign appropriate codes for the highlighted substantive statements such as code "INTCOMM" for highlighted substantive statement "Internal communication between employees". After that then go back to the beginning of the transcript and start deriving a set of categories of themes

from the highlighted statements. Sort these categories and look for any similarities in themes or substantive statements that can be combined. Review the transcript again and assign the highlighted substantive statements according to relevant categories. Next, mark unmatched substantive statements with a question mark and categorise them after assigning the matched highlighted statements. Create an analysis grid with the theme categories as column headers and substantive statements as row headers. The corresponding cell can be a tick or consist of what the respondents said in the interview. Finally, transform the analysis grid into writing to describe any relationship, substantive issues, and themes found from the interview.

Kelle (2000, cited in Eriksson & Kovalainen, 2008) argues that the above analysis strategy links qualitative data to quantitative data where the outcome is analysed through a data matrix. However, Kelle suggests another strategy which is to link qualitative data to grounded theory approach as follows. According to Sauders, Lewis and Thorhill (2000), the purpose of the grounded theory approach is to obtain meanings from the studied subject. First, the textual data have to be formatted then code it with ad hoc codes or so called 'opening coding'. Next, write memos and relate them to portions of the text. After that, then look for codes that are the same and compare its attached portions of texts. Next, combine codes and attach memos into it if necessary then place these codes into broader, related groupings or categories (Sauders et al., 2000).

However, the research can adopt both the strategy provided by Gillham and Sauders et al. as they are very similar in most steps in doing thematic analysis with the aid of one of the CAQDAS software programs called 'NVivo Version 8'. The NVivo software can enable the author to manage, organise, and analyse qualitative data more effectively through transcribing, coding, classifying themes, sorting data, and examining relationships in the data. According to Dolan and Ayland (2001, cited in Eriksson & Kovalainen, 2008), CAQDAS is very useful for analysing large volume of qualitative data. Eriksson and Kovalainen (2008) state that CAQDAS does not provide any theoretical or analytical framework, however, the researcher has to decide on what theoretical and analytical framework that should be employed in the study. Obviously, thematic analysis is the analytical framework used for this research. Eriksson and Kovalainen suggest that it is also important when considering using software in data analysis to

consider the volume and types of data to be collected and ways to handle data during the research.

The translated transcribed interviews data can be imported into the NVivo software. The guidelines provided above in thematic analysis can then be applied whereby the author goes through each interview's data and code substantial statements. After coding all the interviews data, the author can group the coded statements into various themes or ideas. A framework for the research analysis is constructed and provides answers for the main research question.

3.7.2 Document and Diary Analysis

The process here is similar to that in the thematic analysis described in section 3.7.1.3. The collected documents from the case organisation can be sorted according to the categories of themes identified in the interview thematic analysis. Next, go through each document and diary recording and highlight statements that support the themes identified in the interviews. Ignore documents that are irrelevant to the research or make duplication. Use coding to code highlighted substantive statements in the documents. Assign the codes to the analysis grid that has been created in the interview thematic analysis. The documents and diary recordings act as evidence for the interviews and also help to generate new ideas where necessary. The documents with no relevant category can be analyzed again for a new category. Go through all the collected documents and making sure that all relevant documents are included in the analysis grid.

3.8 Conclusion

Chapter 3 states the research main question and sub questions for the research so that the answers to these research questions can reveal the factors influencing the ICTG implementation in organisations in order to develop good practices to assist with implementing effective ICTG in organisations. The chapter states that the best approach to find the answers for the research questions is to conduct an exploratory research through utilising case study methodology at the Ministry. The methods for data collection involve unstructured interviews, documents collection, and diary recordings. The collected data can then be analysed through thematic analysis method with the aid of NVivo software program. The interviews data can be transcribed in two phases where phase one is the

transcription of the actual interviews and phase two is the translation of the actual interviews into English language for analysis and reporting according to AUT requirement. The author predicts that the responses from participants can be mostly in Tongan language. The field research can now proceed and the finding will be reported in chapter 4.

Chapter 4
Report on Field Findings

4.1 Introduction

The research was conducted in Tonga and its government that consists of more than 10 ministries and departments. One of the ministries was selected as the case study organization for the research which is the Ministry.

The Ministry was established to prudently look after the moneys of the Government of Tonga and also advise the government on the management of the economy according to the website of the Ministry. The Ministry comprises of three main offices which are located at Nuku'alofa, Tongatapu. There are more than 100 employees in the Ministry. The vision of the Ministry is

> *"to create the necessary fiscal and a macro economic environment that accelerates the economic and social development to increase the overall standard of living of the people of Tonga"* (Corporate Plan for 2007-2010, 2007, p.7).

Chapter 4 is structured to report the findings of the field research. First in section 4.2 the issues and challenges that were faced by the author who is the researcher while attempting to implement the research methodology of Chapter 3 are elaborated. This section declares variations to the plan and provides explanation of the context from which the data was gathered. Section 4.3 reports the interviews and the documents that were collected from the field. Again the context is also reported in terms of the access, the protocols and the ways the interviewees interacted with the researcher. Section 4.4 reports the findings from the perspectives of structures, processes and communication mechanisms. The data is hence analyzed using the theoretical frameworks presented in Chapter 2 and presented in text, graphs, and tabulated forms. Section 4.5 makes the conclusion to Chapter 4 and provides a link to Chapter 5 where the findings are discussed.

Note that the word "ICT" will be used interchangeably in its meaning throughout the dissertation. ICT is mostly referred to the ICT division but sometimes it refers to the technologies in ICT depending on the wording of the sentence.

4.2 Issues and Challenges

One of the issues and challenges in the research is getting the approval for the ethics applications for the research from the AUT Ethics committee. The process was started months before the proposed research and the researcher was well grounded in risk appraisal, particularly inter-cultural and privacy risks. However, the process ended up involving sending back and forth of the ethics applications with minor amendments. For this reason, the field study was delayed for about two months until the ethics applications were approved. Finally at the end, the researcher's intentions proceed as specified in the first application (See Appendix A).

The next challenge was trying to gain access to the research field, the Ministry in Tonga to conduct the research. Initially the researcher presumed that the approval from the Minister would be the final process for gaining access to the case and allowing the researcher to conduct the research. Unfortunately, the researcher was later advised by the Ministry that every research proposal on government ministries or departments had to be referred to the Prime Minister of the Government of Tonga for endorsement according to government policy. Hence, the researcher had to defer the proposed commencement date of field study to a later date. Thankfully, the Prime Minister supported and endorsed the research three weeks later and the researcher then arranged the travel to the field and commenced the data collection for the research.

Another issue was the funding for travel expenses to the case organization. The researcher presumed that funding for the research would be supported by the New Zealand Government's International Aid and Development (NZAID) agency because the researcher is currently one of NZAID awardees. Unfortunately, the research does not suit the funding requirement of the NZAID and therefore NZAID denied funding the research. However, due to the limitation of time to search for alternative funding sources and the significance of the research to the researcher, the researcher therefore self funded the travel expenses for the research.

The availability of the interviewees was also an issue. The target population for the research was the members of the executive management team of the Ministry. Thus, some of these members were on leave during the period of data collection for the research. Furthermore, the period of data collection for the

research collapsed with the ICT conference of the Pacific Forum countries called the "Pacific ICT Ministerial Forum" which was held in Tonga during the data collection period. Some of the interviewees participated in this conference which caused delay and difficulty in making interview arrangements for those interviewees. Some of the interviewees were also engaged with important meetings during this period of data collection. Despite all that, all the available expected interviewees were able to be interviewed within the allocated data collection period.

The scattered location of the Ministry's offices was also a challenge to the researcher in trying to locate the interview premises and to be on time for the interviews. The Ministry has two other offices that are located in different areas but within walking distances for the researcher. Some of the interviews' appointments were scheduled close to each other but they were held in different offices within a single day. So, the researcher had to rush for the next interview appointment in the other office right after the one in the other office was completed. Some of the interview appointments were requested to defer to later time so that the researcher could be at the interviewee's location on time. So, a lot of walking between the case's offices and rescheduling were involved in the research.

Some of the interviews were interrupted by a meeting of the Ministry which was held in the same room that the interviews were taken place. So the interviews had to stopped and shifted to another room and continued on the interview.

Due to limitation of time for the research, the researcher could not attend any case's executive meeting in which one was scheduled to be held on some date later after the data collection period but depending on the availability of the Chairperson.

4.3 Field Events

The researcher entered the field and conducted the research in accordance with the preset requirements given in Chapter 3. The target population for the research was the members of the executive management team and senior managers of the Ministry in Tonga. The selection of the sample size for this study was made in accordance to their role in relation to ICTG and availability. However ten

participants were willing to participate in the research which was more than eight members that were predicted in Chapter 3. The research was conducted using qualitative approach through unstructured interviews, interview digital recording, and diary recording. All selected participants managed to participate in the interviews face-to-face and were asked to talk about the implementation of ICTG in the Ministry.

Prior to the actual field study, the researcher first made contact via email and telephone with the Ministry seeking support and approval for the research. Once the approval was confirmed, the researcher then liaised with the Ministry on possible participants for the research. Next, the researcher sent email together with the "Participant Information Sheet" explaining the purpose of the research and the "Consent Form" for participants to sign if they agreed to take part in the research. For those who were willing to participate in the research, some sent emails to researcher confirming their participation and indicated the time for their interviews whereas some, the researcher had to call them by telephone to confirm their participation and scheduled their availability for the interview. For some of the participants, the researcher had to meet them face-to-face more than once to allocate a suitable time for their interviews. Fortunately, most of the possible participants for the research were willing to cooperate and took part in the research which was really appreciated.

4.3.1 The Actual Interviews

The researcher conducted in depth and unstructured interviews with a total of ten participants. These participants consist of one Chairperson, one member who worked as Director, three members who worked as senior managers and five members who worked as assistant managers in the Ministry. The actual positions and identity of these participants are protected in accordance with the research ethic policy of Auckland University of Technology (AUT). Seven of these participants responded that they are full members of the executive management committee of the Ministry whereas the other two participants responded that they had participated in some of the executive management meetings.

Six of the interviews were conducted face-to-face in a dedicated conference room within the head office and the other two offices of the Ministry whereas four of the interviews were conducted face-to-face in the interviewee's

office room. All of the interviews were started with a greeting leading to open questions and answers just like a normal conversation and closed with thanking the interviewees for their contribution to the research. The researcher avoided controlling and limiting the responses from interviewees but guided them using the 'interview starters' outlined in Chapter 3 instead. All participants were informed that they could respond in either in Tongan or English language or whatever language that they felt comfortable with. As the researcher expected, most participants responded in Tongan language or mixture of Tongan and English as they felt more comfortable and fluent in communicating in their mother tongue language. On the other hand, a couple of participants responded mostly in English language. Participants were also informed about the purpose of the research using the Participant Information Sheet and Consent Form used for the research (See Appendix B and Appendix C). All participants signed the Consent Forms before participating in the research. In some interviews, the researcher had to explain the meaning of ICTG in order to gain relevant information for the research from the participants.

With the face-to-face interviews, a small digital voice recorder was placed on the table between the researcher and the interviewee to record the interviews with the permission of the interviewee. The conference room and interviewees' office rooms had a table and chairs for both the researcher and interviewee. All rooms were less disrupted by noises even though those rooms were located along the busy roads of Tonga. Some of the interviewees unplugged the telephone in their office room to avoid interruptions and that was also why some interviewees preferred to conduct the interviews in the conference room to avoid disruptions from their co-workers too.

Most of the interviews lasted for about thirty minutes. Two of the interviews were about forty minutes long and the shortest interview was about thirteen minutes. Notes were taken after the interviews to avoid disruptions during the interviews while totally relying on the digital voice recorder to record the whole interviews and to be analysed later.

4.3.2 The Actual Data Sources

There were three main types of data sources used in the research. These data sources were the digital voice recorded interviews, relevant documents in

electronic formats plus the Ministry's website, and diary recordings on paper format. These data sources are summarised in the table below.

Data Sources	No. of Items	Details of Items
Recorded Interviews	10 participants	– 1 Chairperson (Interviewee A) – 1 Director (Interviewee B) – 3 Senior Managers (Interviewees C, D, E) – 5 Assistant Managers (Interviewees F, G, H, I, J)
Relevant Documents	6 documents plus Ministry's website	– Ministry's Organisation Structure – Corporate Plan – Ministry's Budget Summary – ICT Annual Management Plan – ICT Organisation Structure – ICT Roles and Responsibilities
Diary Recording	1 diary book	– 8 days of diary recordings

Table 4. 1: Data Sources Summary

(Source: Author, 2009)

4.3.3 The Actual Data Analysis

The researcher approached the data analysis in accordance with the guidance provided in Chapter 3. The recorded interviews were downloaded into the researcher's computer and each interview file was coded so the interviewee could not be identified. Next, the researcher transcribed the actual interviews by playing the interviews using the software called Digital Voice Editor Version 3.1 from Sony Corporation. The Digital Voice Editor software allowed the researcher to pause, rewind, fast forward, or replay part by part of the interviews. The researcher used Digital Voice Editor software to play the interviews while transcribing them into text format using Microsoft Notepad application software. The researcher spent about two hours per ten minutes of recorded interview. Some of the interviews, the researcher spent six to eight hours transcribing. Some of the short interviews were only about three hours. The main factors during transcription were the speed of the researcher's typing and the speed of the interviewees' responses in which some responses were quite fast. Luckily, the Digital Voice Editor had a feature that enabled the researcher to adjust the speed

of the responses so that the researcher could hear the responses clearly. The researcher replayed each interview again and double checked the transcriptions after transcribing all the interviews. As mentioned earlier, most of the participants responded in Tongan or mixture of Tongan and English language and thus, the transcripts were mostly in Tongan language.

After transcribing the interviews, the researcher then translated all the transcribed interviews into English language. The process was faster than transcription as the researcher spent about thirty minutes to one hour per ten minutes transcript of recorded interview for translation. For the longest interview, the researcher spent between two and three hours translating. For the shortest interview, the researcher spent about thirty minutes to translate its transcript. After translating all the interviews' transcripts, the researcher double checked the transcripts starting from the first translated transcript to ensure that meaning and ideas from the responses were still maintained after translation. The process was repeated for the rest of the translated interviews. The Microsoft Word was the application software for the translation process. The interview's transcript Microsoft Notepad file was opened alongside a new Microsoft Word document and the researcher had to translate sentence by sentence according to the translation guidance in Chapter 3 and making sure that the meaning and ideas are maintained after translation.

After the translation, the researcher imported all the translated transcripts into NVivo Version 8.0, the qualitative analysis software used in the research. As mentioned in Chapter 3, NVivo allowed the researcher to go through each interview's transcript and coded arising ideas and themes that were stood out from the transcripts. After coding, the researcher organised and grouped related themes and categorised them into the main three focus areas of the ICTG framework presented in the Chapter 2 which are structure, process, and communication. NVivo also allowed the researcher to create models from the codings.

However, the researcher found that the methods outlined in Chapter 3 only looked simple in theory but the methods really consumed a lot of researcher's time and energy in practice.

4.4 The Findings

Based on the studies by Van Grembergen and De Haes and Weill and Ross (referenced in Chapter 2), the research was structured around the advocated ICTG framework which consisted of three main focus areas: structures, processes, and communication mechanisms. These have been defined in Chapter 2. Hence, the structure of the findings elaborates the mechanisms and influencing factors for each focus area. In sub section 4.4.1 the elements of structures are reported including descriptions of structure mechanisms and factors that influence those structure mechanisms found in the field research. Sub section 4.4.2 reports the elements of processes including descriptions of process mechanisms and factors that influence those process mechanisms. The elements of communications are reported in sub section 4.4.3 including descriptions of communication mechanisms and factors that influence those communication mechanisms.

4.4.1 Structures

This section reports and describes the structural mechanisms that were found from the field research in sub section 4.4.1.1. In sub section 4.4.1.2, the reported structure mechanisms are summarized through a tree nodes model extracted from the NVivo software. The factors that influence the implementation of these structural mechanisms are also identified and described in sub section 4.4.1.3. Sub section 4.4.1.4 presents the factors found in a chart with respect to the number of interviewees who commented on each factor. Sub section 4.4.1.5 summarizes the factors found that influence structural mechanisms through a tree node model extracted from the NVivo software.

4.4.1.1 Structure Mechanisms

This section describes the structure mechanisms found in the field research. These structure mechanisms will be described in the following order from sub section 4.4.1.1.1 to sub section 4.4.1.1.8 consecutively: ICT organization structure, HOD committee, ICT steering committee, internal audit committee, ICT budget, ICT governance model, ICT roles and responsibilities, and strategy plan.

4.4.1.1.1 ICT Organisation Structure

The Ministry consists of five main divisions which are the Planning, Social and Economic Policy, Budget Management and Procurement, Aid and Project Management, Shared Services or Corporate Services, and Treasury Operations. ICT is grouped together with Administration and Human Resource section under the Corporate Services division according to The Ministry Organisation Structure (n.d.). As said by Interviewee B that

> *"IT is combined with the Administration under the Corporate Services which is the share services division whereas Treasury and Economic and Budget are separate divisions. In this structure, the Administration and IT stand together as share services because they are the supporting services for the whole organisation."*

Interviewee C also agreed that

> *"IT is under the Corporate Services. Corporate Service consists of the Administration and IT and there is a Deputy of the Corporate Service. There is also a head for each of the two sections. So it is like two sections that are combined together into a single division. So IT goes in his way whereas Admin goes his way but their head is the Deputy of Corporate Services. "*

Within the ICT division, there are two main sections which are the Application and Infrastructure. The Application section takes care of the supporting role for the business applications and provides training on computer software applications whereas the function of the Infrastructure section is to administer and monitor the network systems and computer hardware systems including servers and client computers of the Ministry. Each section has its own manager. These two managers are at the same level according to the Ministry's staffing salary scale. This is a newly structure for ICT that was implemented recently. This newly ICT structure replaces the old structure that caused issues and difficulties with how ICT provided their services in the Ministry. The current ICT organisation structure is demonstrated in figure 4.1.
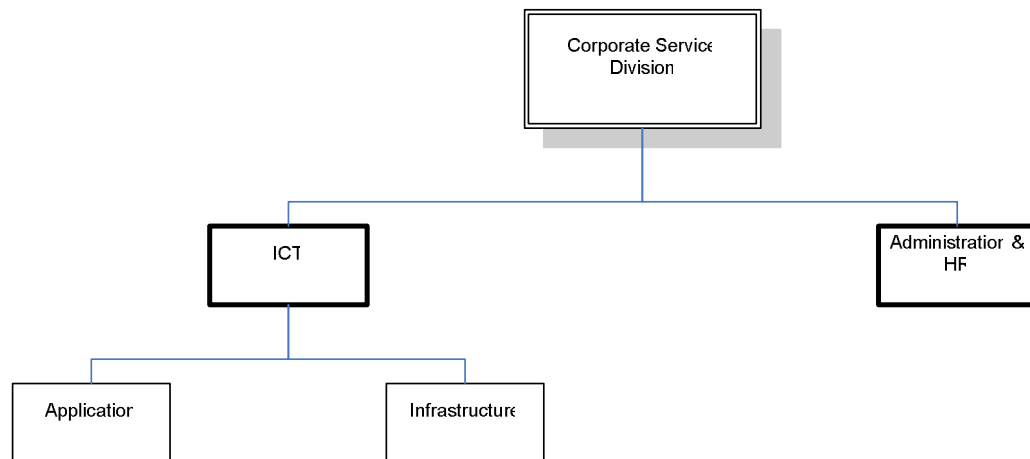
Figure 4. 1: ICT Organisation Structure

(Source: Adapted from IT Division Structure, n.d.)

Currently, the manager of Application section is acting on the vacant position of the head of corporate service division.

4.4.1.1.2 HOD committee

Head of Division (HOD) committee is one of the mechanisms in ICTG of the Ministry which consists of members from all heads of divisions including the Director and the head of the Ministry according to Interviewee B. The reporting structure of HOD committee in the organisation is demonstrated in figure 4.2 below.
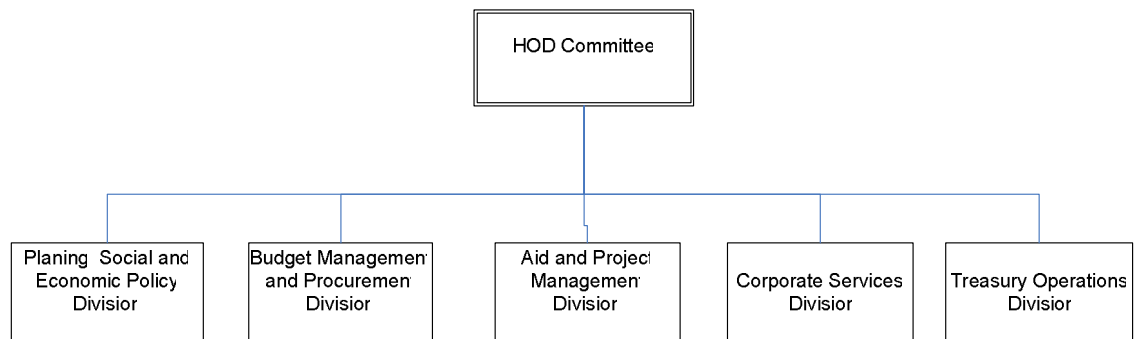
Figure 4. 2: HOD Committee Reporting Structure

(Source: Author, 2009)

HOD meeting is usually held in every week and sometimes fortnightly or monthly depending on the availability of the head of the Ministry according to Interviewee D. Sometimes the head of the Ministry directs the Director to call and chair the HOD meeting. As said by Interviewee G that "if the Chairperson is not here then

the Director would chair" the HOD meeting. The purpose of this meeting is for all heads of divisions to report the progress of their work from since the last HOD meeting and the progress of the annual management plan (AMP). AMP is the annual management plan or the strategic plan designed by each division for the current financial year. The HOD meeting is the only meeting where ICT can communicate with all members of HOD. In addition, Interviewee B said that HOD committee "is the committee that makes the decision making on IT matters."

The issue here is that ICT is communicated through the head of corporate services division in the HOD meeting. The head of ICT is not a member of the HOD committee. The head of ICT is only participated in HOD meeting because he is currently the acting head of corporate service division.

However, the head of ICT should be a member of the HOD committee but the current organisation structure prevents the participation of the head of ICT as a full member of the HOD from happening because ICT is still under the corporate service division whereby only the head of division becomes member of the HOD committee. The lack of involvement of ICT in the HOD committee may lead to misconception of the role and importance of ICT to the operation of the Ministry.

4.4.1.1.3 ICT Steering Committee

ICT steering committee is a crucial structure mechanism that was proposed by ICT to HOD in 2008 to be established to empower the ICT decisions and initiatives and improve the linkage between ICT and other divisions in the Ministry according to the responses from interviewees. According to Interviewee D, this proposal was well supported by HOD members but ICT is required to follow up this proposal and make sure that ICT steering committee is fully active. Interviewee D went on and said that

> *"as I mention before one of my roles is a member of the steering committee but I think we only met once when it was reactivated but it needs to be revived and to be proactive. The steering committee was established as the proposal was put forth and it was generally agreed during the HOD meeting and then after that it was rely on the head of IT*

to run and steer the committee like calling the meeting when it is possible."

Interviewee H also stated that ICT steering committee

"will ensure that the decisions that were made have also considered the concerns from other divisions. Although sometimes when we make decisions we also considered other divisions but they just think that these decisions were made by IT only. So if other staff from other divisions involve in decision making also including the Director or the Chairperson like to get their views and then there will be an extra power in that decision. It's like that things will move forward."

According to Interviewee H, involving other divisions in making ICT decisions would make ICT decisions more powerful and speeding up its processes as well. According to Interviewee I, solving of ICT issues like issues with funding will be faster and ICT projects will be in the top priority category of the Ministry. In addition, Interviewee I believed that ICT steering committee would make its members own and accountable for the decisions that they made on ICT initiatives.

Interviewee I believed that "the IT Steering committee will be established so that the steering committee would feel being the ownership of such project." The proposed members for the ICT steering committee were consisted of the head of divisions and chaired by the Director. According to Interviewee I that

"all HODs will become members for they are the top end-users and they are the ones that we are providing services for. They should also feel that they own the project and they have a say about any thing that are done on IT. This is one way to close the gap between IT and executives and when it comes to solving an issue it will be faster as the heads of divisions are members of the committee. For example, if fund is required, it will be faster. It will also work on the other way like if there is an issue which is important to treasury and they raise it to the Director and then it will directed to IT to stop whatever they are doing for this becomes top priority."

The reporting structure of the proposed ICT steering committee in the Ministry is demonstrated in figure 4.3.
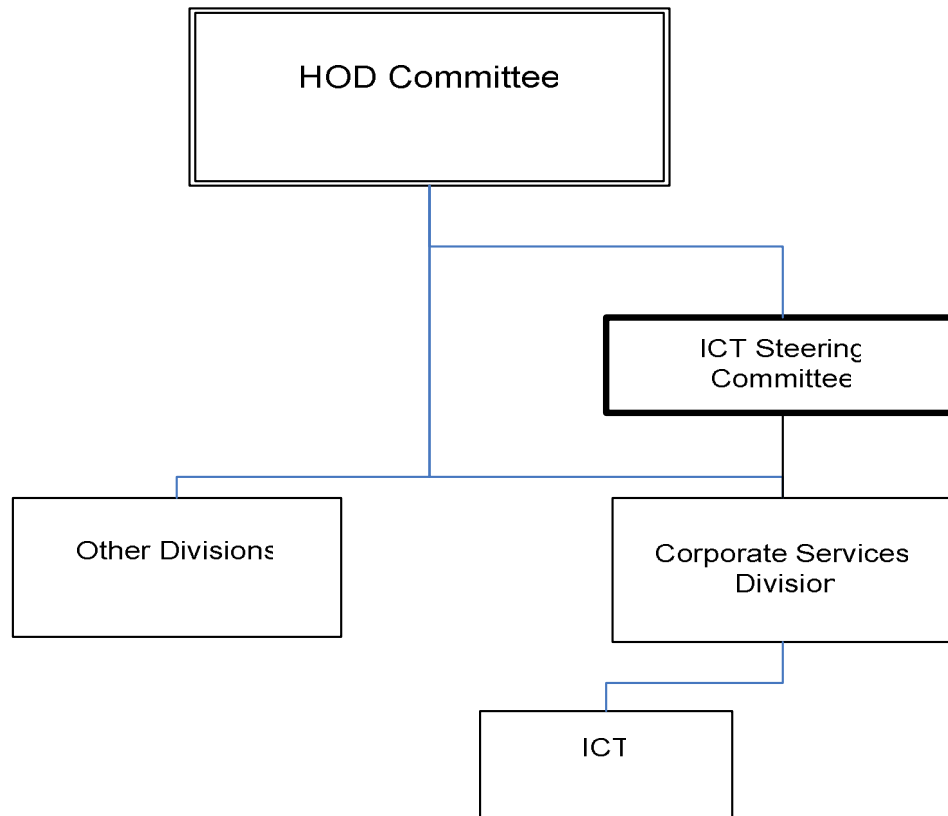
Figure 4. 3: ICT Steering Committee Reporting Structure
(Source: Author, 2009)

ICT can report or submit their ICT projects and initiatives to the ICT steering committee through the head of corporate services division. ICT steering committee will then report their decisions on ICT projects and initiatives to the HOD committee.

The purpose of the ICT steering committee is to make decisions and administer the ICT projects implemented in the Ministry. ICT steering committee is also required to report to the HOD committee on the progress of ICT projects. ICT steering committee is the committee that ICT can channel through all their ICT projects for approval. The other benefit of having the ICT steering committee is to make ICT decisions and expenses more transparent and also break down the communication barriers which always lead to misunderstanding between ICT and other divisions. According to Interviewee I,

> *"The purpose of HOD meeting is different and sometimes IT is not center staged but IT is required to be center staged and make the big expense on IT transparent and then they should question whether this expense is necessary."*

By establishing the ICT steering committee, ICT initiatives will be the sole focus of this committee in contrast to HOD committee.

4.4.1.1.4 Internal Audit Committee

The research found that the Ministry needed to establish an internal audit committee within the Ministry. According to the concern from Interviewee A, that the Ministry required

> *"to establish an internal audit capacity here in the Ministry to be able to check the activities that are carried out by the Ministry and other ministries."*

Although the internal audit committee had not been established, but the research identified that internal audit committee is an important mechanism in the governance of the Ministry. The internal audit committee will ensure that ICT operations are compliance with ICT policies and corporate policies. The reporting structure and members of this committee were not defined but the internal audit committee was stated in principal.

4.4.1.1.5 ICT Budget

The way the budget is formulated was in accordance with how the organizational structure is formed. So, there is an allocation in the Ministry's budget for ICT expenses. According to the budget summary of the Ministry for financial year 2008 to 2009, ICT allocation is about 7% of the total budget of the Ministry. ICT is ranked forth in the allocation ranking per division of the Ministry's budget which indicates that ICT is not really the priority in the Ministry. Similarly, Interviewee B said that

> *"Just like the how the Ministry is structured, the structure of the budget of the Ministry is also the same. So the budget for IT and corporate services are different but within these two, there is a subprogram for IT."*

4.4.1.1.6 ICT governance model

There was a model adopted by ICT to improve the old structure of ICT to the current structure. The model was adopted from a book by John Baschab and Jon Piot called "The Executive's Guide to Information Technology" according to the response from Interviewee H that

"There is a structure that we use at the moment which was adopted from a book about IT Governance. We adopted most of its structure for decisions and stuff and use it at present like the method for establishing a steering committee is from the book. I do not know the name of this model but the structure for distributing the responsibilities was adopted from this book. The book is called "The Executive's Guide to Information Technology" by John Baschab and Jon Piot."

Similarly, Interviewee I said that

"There is a model that we use in which we adopt it from book called "The Executive's Guide to Information Technology" by John Baschab and Jon Piot. The book is very useful for our work and it is also related with ICT Governance. "

4.4.1.1.7 ICT Roles and Responsibilities

According to Corporate Plan for 2007-1010 (2007) of the Ministry, the core responsibilities of ICT are to: develop appropriate information management strategies and systems to support the requirement of all divisions in the Ministry, develop appropriate support and maintenance strategies and standards for all computerized systems in the Ministry, ensure the continuation and effectiveness of the operation of the network system of the Ministry, ensure the allocation of computers to facilitate the needs of the Ministry, undertake any software development and support that may require by the Ministry, provide training for end-users of the Ministry, develop required database systems for the Ministry, support and maintain the Ministry's electronic communication facilities, maintain the computer inventory of the Ministry, convene and support the establishment of an inter-Ministry working group on information management system project, provide support of the computerized financial management systems to other ministries and departments, and prepare the AMP for ICT.

The role of the head of ICT is to oversee and manage the ICT division. There are two heads in ICT – one for the Infrastructure section and one for the Application section and they are both at the same salary scale level which is level 7. Thus, the head of Application is the most senior in both of them in terms of number of years of work experience and he is the one who is treated as the head of ICT. In addition, the head of ICT is also acting as the head of the corporate

service division. So, the head of ICT is also in charged of managing the administration and human resource section. One of the critical roles of the head of ICT is to prepare the AMP for corporate service division. The AMP would include goals and objectives of ICT, its proposed action plan and projects, and budget for the following financial year. Interviewee I reported that

> *"My role is that I am the head in the IT section. May be it is not right to say the head but the most senior person instead. So it is with me the responsibility to oversee the IT section."*

Interviewee C also agreed that "the head of IT oversees the IT and the Administration as well." Interviewee B reported that it is the responsibility of

> *"the manager of the corporate service and IT should bring forth their proposed programs for the next financial year and also propose its financial resources, human resources and what are the things to just to maintain the current system and also identify the new proposals."*

Moreover, the responsibility of the head of Infrastructure section is to manage and oversee the Infrastructure section as well as assisting the head of ICT. According to the response from Interviewee H that

> *"I am in charged of the infrastructure. I manage everything that are related to networking including local network in the Ministry and GOTNET, purchase of telephone equipment that we use here, servers, help desk and support for IT and purchase of IT equipment, procurement stuff and also manage the vote of IT, projects that are related to infrastructure like to replace the current telephone system here in the Ministry and manage the backup power system of the Ministry, we need generator and UPS and new infrastructure that we just shifted to. Also include here the design and implement of a project. And mainly manage the staff in our section for before we had four but there are only three now who are under me. I also manage all the workstations of this Ministry and trying to standardise all the programs and processes of purchase of computers also include managing the configuration for someone to use the programs. Furthermore, I manage the email, internet and backup system of the Ministry."*

The role of the Director of the Ministry is to oversee the whole operation of the Ministry and making sure that functions of the Ministry are performed. In

addition, the Director is also responsible for managing and monitoring the corporate plan of the Ministry. In relation to ICTG, the Director has the authority to approve most of the projects and purchases of ICT equipment. For some ICT projects, it has to be submitted to HOD committee for further discussion and approval according to response from Interviewee I that

> *"For purchasing of computers, it normally passes from the head of infrastructure to the Director and sometimes it comes through me....The IT proposal can also be discussed in the HOD like our latest new infrastructure it went up to the HOD and presented to them to get some feedback but most had no feedback."*

Interviewee C also reported that

> *"The thing specifically for IT related matters are reported directly to the Director. If there was a senior manager then their matters will be taken to their senior manager and then from there to the Director. Such matters like things for proposal approval such as a project. They will then be reported in our HOD meeting. In this HOD meeting, the head of corporate service will report the progress of their work by then".*

4.4.1.1.8 Strategy Plan

The Ministry has a corporate plan which is a three year plan that operates for the years 2007 to 2010. The Corporate Plan consists of the Ministry's vision, mission, organization structure, roles and functions, and AMP (Corporate Plan for 2007-2010, 2007). AMP is the annual plan for each division which is derived from the Ministry's corporate plan. AMP consists of objectives and program activities for that division. The corporate plan of the Ministry is linked to the Strategic Development Plan (SDP) of the nation which is so called the SDP8. According to the interviewees, SDP8 ends at the end of 2009 and they are currently working on the SDP9. SDP consists of the vision, goals, and plan for the nation of Tonga. However, each corporate plan of ministries and departments has to link to the SDP as Interviewee D said that

> *"Our strategic development plan that is the national development plan for all of Tonga. And then it came with three components are the vision for the whole Kingdom, the goals and the current plan. We have eight fundamental goals. Those highlight the broad areas of development*

> *priorities for Tonga. But its linkage so each ministry they have their*
> *corporate plan and their annual management plan."*

4.4.1.2 Summary of Structure Mechanisms

The tree representation below summarises the identified structure mechanisms described above. The structure mechanisms tree nodes model below is an extraction from NVivo software.
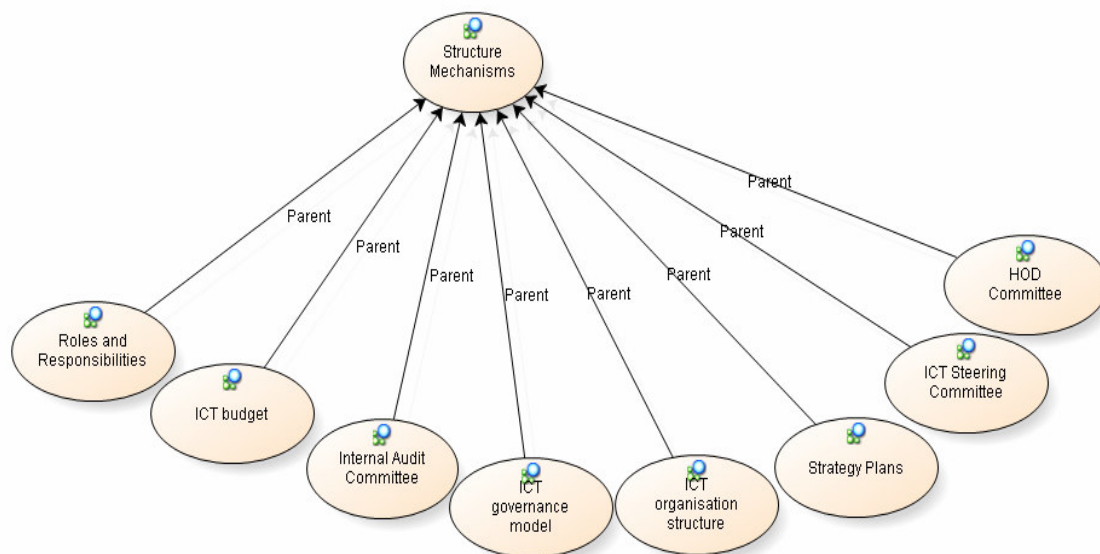
Figure 4. 4: Structure Mechanisms Tree Nodes
(Source: Author, 2009)

4.4.1.3 Factors influencing Structure Mechanisms

This section describes the factors that influence the structure mechanisms found in the field research. These factors will be described in the following order from sub section 4.4.1.3.1 to sub section 4.4.1.3.16 consecutively: inadequate ICT structure, hierarchy in the organisation structure, seniority in the organisation structure, respecting each other, conflict of interest for ICT, lack of staff, dependency on the Chairperson, aligning ICT strategy plan with corporate plan, ICT to be more strategic, ICT to be more coordinated, ICT governance should be addressed in SDP, ICT responsibilities are not defined clearly, lack of leadership, lack of understanding on ICT management, awareness on the importance of ICT, and awareness on the importance of ICTG.

4.4.1.3.1 Inadequate ICT structure

Given the structure of ICT that is currently implemented in the Ministry, ICT and executive management members still feel that this structure should be reviewed to reflect the main key objectives of ICT in the Ministry which are: to facilitate the core functions and responsibilities of the Ministry, develop and manage the Ministry's ICT infrastructure, and provide a systems development service for the Ministry (Annual Management Plan, n.d.). According to the response from Interviewee A as one of the executive management members that

> *"There is a great need to improve the structure of IT. Currently, IT is part of corporate service division but it is required to be reviewed carefully. If IT is part of corporate service then it is still required to review the structure of IT again whether this is appropriate or not. At the moment, because IT in some places is part of the financial system, IT does not attach to corporate service but it attach to the financial system. It is uncertain at this stage but this is something that we must look at to review the structure of IT."*

The above response suggests that ICT should be reviewed in accordance with how ICT is structured in other organizations whether ICT should be placed together with the finance division or remained with the corporate service division.

There is also a concern on the current structure of ICT because ICT is combined with the Administration and Human Resource section under the corporate service division and hence, the issues related to either section will be shared by both sections. For example if an issue related to Administration and Human Resource arises, that issue will also affect ICT as well for they are both under the same division. ICT feels that sharing the issues of Administration and Human Resource is too much for them to handle for they already have enough issues in ICT to deal with. Moreover, those issues also make the performance and services of ICT look bad even though they perform well. The argument above is illustrated by the response from Interviewee H below that

> *"The problem that I can see when we are under the corporate services there are lot of problems there. Like now the head of application is acting on the deputy corporate services. If the acting deputy of corporate services is absent then I will have to cover up for him. It is like that the person who is looking after that will try to cover both sections although*

there a lot of problems in IT and lot of problems from Administration in trying to share and push the admin part. But sometimes the IT section gets affected by the admin problems. It is like that we are one as if there is a problem with one of the sections it will be a problem for the whole division instead of just a problem with the admin. So if this problem escalates, it will also become the responsibility of the acting deputy corporate services. So the problem with admin will be the problem of the head of corporate service as well and we will all be affected.”

Similarly, Interview G stated that the current structure of ICT is a stumbling block for the development of ICT in the Ministry.

However, some of the interviewees suggested that ICT should be structured as a separate division by itself apart from corporate service division. Some interviewees believed that the structure of ICT should provide a carrier path for ICT staff and helps to retain ICT staff as well. A good structure should also create a good working environment where staff can work together towards achieving the objectives of the division as well as the corporate vision and objectives of the Ministry. The highest level in ICT in accordance with the Staffing Salary Scale of the Ministry is at level 7. Senior managers are at level 2 leaving a big gap between senior managers and the head of ICT. The ICT structure makes it difficult for ICT staff to reach level 2 as they cannot just jump from level 7 to level 2 unless they have done reasonable years of work experience like 10 years. This issue is also unfair for ICT because other divisions have level 7, 6, 5 up to level 2. Apparently, ICT staff view this issue as a discouragement to their carrier path, hence, some ICT senior staff tended to look for another job somewhere else after few years of experience in the Ministry. This issue also leads to the issue with “brain drain” or loosing ICT staff from the Ministry. Evidently, Interviewee H said that some of the staff in ICT had left the Ministry because they felt that they had no carrier path within the current ICT structure. Here are the responses from some of the interviewees. Interviewee H said that

“The main thing here is that may be the carrier path or may be it is just a government thing but this is based in the organisation structure. Since I came back after completing my Master degree there was no change to the post that I am in now. I went to study while I was the systems analyst and when I returned I was and am still the systems analyst. I was already max

in this post before I went and when I returned it is still the same. It is like that there is nothing to encourage me. So this is already evidence in our staff as some have left. So I might look for an opportunity from outside as well."

Interviewee E also said that by having a separate division for ICT "will provide a better carrier path for IT people and also to sustain these people." Interviewee G agreed that

"IT has a separate service to be more efficient in terms of their performance and also to set their career path properly instead of mixing them altogether for they are two totally different backgrounds."

Some interviewees agreed that ICT should be a separate division because ICT is a very technical area and ICT could also perform more efficient like what Interviewee G said. Similarly, Interviewee E said that "for right now we can't do without the computer and those things may be required to be consolidated into one section…because IT is very technical from corporate". However, ICT reported that they had submitted a proposal in 2008 for the new structure of ICT to be a separate division apart from corporate service division but the proposal had not been approved yet.

4.4.1.3.2 Hierarchy in the organization structure

Hierarchy in the organization structure also plays an influencing factor in the implementation of ICTG structure in the Ministry. The organization structure of the Ministry is structured in a top down or vertical hierarchy where the most senior and high paid position is at the top of the structure at level 1 where as the lowest and paid position lies at the bottom of the organization structure at level 14. Thus, those staff who are at the top level of the organization structure get more respect than the ones at the lower level. As mentioned earlier that the most senior position in ICT is level 7, however, from the perspective of ICT they feel that they are not receiving strong respect, support and attention from more senior staff or those who are at level 6 and above on their decision makings. This is reflected from the response from some of the interviewees as follows. Interviewee H said that

"at the moment if we do something in IT the most senior level is system analyst but in comparison with other divisions they have higher levels like

principal and chief before deputy but the highest level for us is the system analyst at level 7. So if we put forth a decision and stuff, I am not sure but I think this is how the others think of us that who are we at level 7 to make decisions for them at level 2 and level 3 above."

Similarly, Interviewee I responded that

"most of the time the executives look at the level that we are at in terms of the hierarchy of the organisation structure. Like us we are at level 7 whereas the heads of divisions are at level 2 and their assistants are at level 5. This is one factor that affects our relationship with the heads of other divisions. There are some heads of divisions are alright and some, they look down on us and think what are those level 7 doing with changing the way we work and stuff."

ICT thought that senior staff above them were paying lack of attention and not really supporting initiatives from ICT just because that they are at lower level in the organization structure. As a result, this sort of attitudes generate barrier between ICT and senior staff from other divisions and the gap between them gradually increases. ICT found it difficult to communicate across to the senior staff resulting in delaying or declining some of the ICT initiatives.

4.4.1.3.3 Seniority in the organization structure

Seniority in the organization is already mentioned above which is also comes out from the hierarchy of the organization structure. The people at the higher level of the structure such as level 6 to level 1 receive more respect, attention and commitment from ICT. Their ICT issues become top priority in ICT support. For example if a level 2 staff has an issue with his computer, once he reports the issue to ICT, ICT response immediately whereas for others ICT response rate would be slower like after an hour or half a day according to the response from Interviewee D below.

"I think from myself they respond to me immediately when I need something but from my staff they usually complain for there are times that they have to wait for a day or two for someone to come."

Interviewee D also said that he thought that his staff

"always complain but it may be related to the way the organisation structure is laid out. Because sometimes my staff come in and ask me to

*ring the IT people instead of them as if they ring they won't turn up. So I
usually I don't call and if I don't call I just drop a line to the head of IT
that I need this and this and this."*

Seniority affects the performance of ICT services and also creates barrier in the
relationship between ICT and end-users.

4.4.1.3.4 Respecting each other

The respect that exists in the hierarchy in the organization structure noted in
4.4.1.3.3, is different from the respect addressed in this section. Respect has to do
with trusting, caring, and committing each other. With regards to ICT, end-users
have to show respect for the services provided by ICT meaning that they have to
trust with the services provided by ICT and in return, ICT care and commit to the
ICT needs from end-users. In doing so, the relationship between ICT and end-
users improve dramatically which is evident from the response from Interviewee
D that

*"one of the attributing factor is the respect each other as when you ask
them something they will do it and they attend to it immediately."*

4.4.1.3.5 Conflict of interest for ICT

As described 4.4.1.3.3, the ICT division is structured together with the
administration and human resource division under the corporate service division.
Currently, the head of ICT is the acting head of the corporate service division.
However, according to Interviewee E that

*"the head of ICT is not very keen to do those administration tasks and stuff
because they are different area altogether."*

It is evident that there is a conflict of interest on the head of ICT where he thinks
that the role of administration and human resource is not his responsibility and
interest. From the response of Interviewee E, the head of ICT is a technical
person and he would not be able to carry out or interested in performing the
administration tasks.

The conflict of interest occurs because of how ICT is currently structured
and this factor is also related to the ICT structure described earlier. However, this
factor affects the role and performance of ICT as well as ICT image in the
Ministry. According to most responses from interviewees that ICT is a

specialized area and should be in a separate division apart from corporate service division like Interviewee G said that

> *"IT has a separate service to be more efficient in terms of their performance and also to set their career path properly instead of mixing them altogether for they are two totally different backgrounds."*

4.4.1.3.6 Lack of staff

The lack of staff is found to be one of the most commented factors by interviewees which is evident from the response from Interviewee B by saying that

> *"It is understandable that IT has insufficient staff. So there is a need for strengthening of the capacity of IT."*

Similarly, Interviewee F agreed that

> *"I think from my perspective that they are under staff. I mean there are cases like when the budget process is carried out they would allocate only one staff and then if such demand upon them they would say that there is no one available. So I think that may be two or three more people then they will be sufficient to cater for everyone's needs at the same time."*

Interviewee H also supported lack of staff factor by reporting that

> *"When there is no one in the support staff then I also cover up that part. We tried to do this but I think there are more than 100 staff here in the Ministry. But we are trying to have at least two people for support and at least one person for helpdesk and then rotate them frequently. But at the moment there is only one for support and no specific one for helpdesk but it is passed around within us. Similarly, for our infrastructure section, there should be a minimum of two staff for network and telephone systems but there is only one person in there which is the network administrator. There should be someone as the upper network administrator. So that when one staff is absent the other one can backup. But at the moment there is only one staff in each sub section. One staff for network and one for telephone system but most of the times I cover all of these."*

According to Interviewee F, allocating one staff from ICT to assist with the budget processing is not enough as sometimes that person is not available or absence from work when he is required. So, more staff should be recruited for

ICT as suggested by Interviewee F. Interviewee H said that there was not enough staff in ICT to support all the staff ICT needs in the Ministry. As a result, there was no specific person dedicated for a particular task in ICT but tasks were shared by all staff in ICT. Although ICT strategy was to have backup staff to ensure the continuation of ICT services, ICT strategy could not be implemented with insufficient staff in ICT.

Interestingly, the research found that ICT of the Ministry was not only providing services to the Ministry but also included some of the other ministries according to the response from Interviewee D that

> *"one of the issue as well is less staff, human resource has raised because that not only they gather for the Ministry but sometimes from outside - other government ministries that they usually require their assistance and their skills to come and thing."*

Interviewee F also agreed that

> *"if we add altogether the Ministries and departments that they are supporting it would be a lot in comparison to the number of staff within IT. There are probably less than 20 people in IT. So that is one thing is their staffing."*

Despite the lack of staff in ICT, ICT managed to use technology for remote access to assist with supporting services in the Ministry according to response from Interviewee I below:

> *"There are also some check points or list to assist with the troubleshooting of a problem like a simple problem and we also use the remote PNC which we can just remote access from here to a computer and solve that problem."*.

4.4.1.3.7 Dependency on the Chairperson

Relying on the chairperson to conduct the HOD meeting is also a factor in ICTG implementation. According to Interviewee D, he said that "The Director is like that he always wants the Chairperson to be present in the HOD meeting." The Director seems to be reluctant to take the lead in the HOD meeting which causes deferral in most HOD meetings until the chairperson is available. The dependency affects the process of ICT projects as well. The deferral of HOD meetings also means delays in the process of ICT projects as well but some ICT

projects are required to be discussed and approved in the HOD meeting. The AMP and budget of ICT for that year will also be affected as well.

4.4.1.3.8 Aligning ICT Strategy Plan with Corporate Plan

The ICT strategy plan which is referred to the ICT AMP is required to align with the Ministry's corporate plan. The ICT AMP should be derived from and linked to the objectives of the Ministry's corporate plan. In doing so, ICT can better support the Ministry and also ensure that business values are obtained from the investment on ICT which is evident from the concern of interviewee A below.

> *"so that they could plan together and as a result the IT plan is aligned with the executive plan. … This is so that IT can prepare and plan to go together with the executive plan."*

4.4.1.3.9 ICT to be more strategic

The responses from interviewees showed the demand for ICT to be more strategic meaning that ICT should take part in the construction of the Ministry's corporate plan. According to Interviewee C, he highlighted the importance of ICT into the operation of the Ministry that "this project cannot be done without IT but IT should be incorporated in the whole corporate plan". It appears here the concern to address ICT in the executive management level through the development of corporate plan in order for the Ministry to perform its functions effectively and efficiently. Similarly, Interviewee A said that "IT should take part in the strategic plan as a whole. ... I believe that IT should be strategic." Furthermore, Interviewee A raised the importance of ICT to the Ministry as most of the Ministry's operations depend on ICT. To revert back to manual operations in the future is very difficult. Interviewee A said that

> *"Because as time goes, it will come to a time that the systems we used will not be able to go back to manual. Automation of systems is gradually increasing. So, what will happen if we go back to manual, staff may not know what to do such as what process that are involved in each function and all that."*

However, by addressing ICT in the executive management level and incorporating ICT into the Ministry's corporate plan will increase the alignment of the goals and objectives of ICT and the Ministry.

4.4.1.3.10 ICT to be more coordinated

According to Interviewee D, ICT is required to be more coordinated which means that ICT has to manage and organize their division to ensure that they provide adequate support for the Ministry. Appropriate staff should be available to attend Ministry's ICT needs. ICT should also make sure that ICT projects are within schedule and budget.

4.4.1.3.11 ICT governance should be addressed in SDP

Interestingly, another concern from interviewees that ICTG should be addressed in the SDP. Interviewee D said "but on IT governance, government should be more aware of the important of it and should promote and it could be included in our Strategic Development Plan (SDP)." The SDP is at the national level, however, by addressing ICTG at the top level of the nation is imperative to the move forward of ICT initiatives in the Ministry. It will also be easier to address and implement ICTG in the ministerial and departmental levels as well. Once ICTG is recognized at the top levels, then ICT will become top priority in ministries and departments.

4.4.1.3.12 ICT responsibilities are not defined clearly

While ICT is providing support services to the Ministry, they claimed that their roles were not certain. According to Interviewee H, that

> *"most of the things it is not really clear to us of our responsibilities. It is mainly that our job is just on adhoc basis whereby when something arises then we decide that this is something that we should do for it is related to infrastructure and then we attend to it."*

The research found that the roles and responsibilities of ICT were not clearly defined so that ICT knew the scope of their duties. The research also found that ICT were just reactive to whatever tasks that came by which were related to ICT. Furthermore, Interviewee H said that

> *"There is also something which is sometimes uncertain like that our duty is still vague. Sometimes there are lots of tasks for us to do with the other ministries. Sometimes they just call the Director and tell him their requests and then Director directs us to attend to it. … Our support is supposed to limit only on the link to GoTNET excluding any computer*

problems with the ministry who connects to GoTNET. They always get it wrong and think that every IT problems is our responsibility. For example if their Sun System or computer is not working and they blame us that this is our responsibility for it is the outcome of our connection. But we found out that this problem is just their internal problem like their local area network is not working or disconnected, but we normally just continue to fix their problems as well. … But this is where we are not quite sure of the limit of our duty. Sometimes we do more for some ministries and sometimes we feel sorry for some and help them out with their problems."

Again the scope of the responsibilities of ICT seemed undefined and as a result, ICT seemed powerless to stand its ground and had lack of leadership to control its management.

4.4.1.3.13 Lack of leadership

The lack of leadership is another factor that exists from the responses of the interviewees which influence ICTG structure mechanisms. There is an increasing need for someone to take robust leadership in ICT to push forward the initiatives from ICT and also lead ICT in a proactive way instead of being reactive to what the Ministry requires like Interviewee C said that "I think that what is lack in IT is for someone to become their leader to push everything that they require." Similarly, Interviewee H said that without a leader in ICT "it is like that it is difficult for someone in IT to push or drive an issue. There are a lot of things to push up in both sections." The response from Interviewee H is also reflected in the organization structure of the Ministry as mentioned earlier where level 7 is the highest level in ICT creating a gap between level 7 and level 2, unlike with other divisions in the Ministry. However, ICT proposed to fill up this gap by having some positions between level 7 and level 2. ICT needs a leader to take lead and more involve in providing ICT initiatives to achieve the ultimate goals and objectives of the Ministry.

4.4.1.3.14 Lack of understanding on ICT management

The lack of understanding on ICT management was found to be a factor that affects the implementation of Strategy Plan where ICT staff were not monitoring the progress of ICT AMP. For example, ICT was not sure of the timeframe for

the AMP. According to Interviewee H, he said that "We have our own annual management plan for every year. It is yearly or five years but I am not quite sure." ICT was not sure whether AMP was a yearly or five year plan. Thus, ICT is required to ensure that their plan is up to date. Not only that, but ICT should ensure that ICT is operating according to plan and ICT plan should also be aligned with the Ministry's corporate plan. According to Interviewee H, that

> *"This is just the management plan from the beginning with very minimum update. The latest update we tried to amend the objectives and stuff to align with our tasks now."*

4.4.1.3.15 Awareness on the importance of ICT

The awareness on the importance of ICT is also another factor that influences ICTG structure mechanisms, however, it is imperative for end-users to increase awareness on the importance of ICT to the operation of the Ministry. In doing so, end-users will then realize and appreciate the capabilities and benefits of ICT and how ICT can improve the operation of the Ministry. Once the end-users realize that, the implementation of ICTG in the Ministry will be simple as communication gap between ICT and end-users has been reduced through awareness. As Interviewee D supported that

> *"in terms of ICT governance, base on what I know because the topic now is really important and it is becoming very important compare to the past decade ten years ago. … Now everyone is using IT - computer so the interest and importance of the topic is really essential and vital at the moment."*

Interviewee B recognized the capability of ICT by saying that

> *"the system can be operated online here at the Ministry so that we could know the spend of each Ministry. Not only that, we could also oversee from here and monitor the operations that are carried out on that side."*

4.4.1.3.16 Awareness on the importance of ICTG

It will be much easier to implement ICTG in an organization given that awareness on the importance of ICTG is high in the organisation. From the perspective of the researcher, there was lack of knowledge about ICTG in the organization although that the mechanisms of ICTG are already in placed. According to the

diary recording of the researcher, the researcher had to explain the meaning of ICTG to some of the interviewees before proceeding with the interviews while some of the interviewees had great understanding on the significance of having a good ICTG in the organization. For example, Interviewee F responded with clear understanding of the benefit of ICTG that

> *"It is good to have good governance like control and those 'cause there are benefits in governance. Without good governance everything will be in chaos. So it is vital to have governance – to have processes and procedures on how to do things. Not only for us who are actually working now but also for those who will be recruiting in the future that they can be able to follow thru these processes and procedures without the need for more training and things like that. I guess to have processes in placed, control in placed in IT, good governance and that, I totally support that."*

Interviewee F acknowledged the benefit of having ICTG by saying that good governance in ICT consisted of control, processes, and procedures. ICTG ensures the continuation of the operation of the Ministry.

Similarly, Interviewee B said that

> *"The important thing here is to first print in black and white the word "Governance". After that then establish a committee with the authority to look after and oversee this matter. But the right thing is to understand the clearance to it. So it is imperative to have an Act and policy and establish a governance body to look after this. And not only that, but to enforce the compliance policy but I believe that these links are required to be improved which is the important thing that we should look at in the future."*

Interviewee B stressed the importance of understanding the meaning of the word "Governance" in ICTG. Interviewee B demonstrated a great understanding of ICTG where it is important to have an ICTG committee to oversee the implementation of ICTG and to have act and policy in placed as well.

4.4.1.4 Graph representation of Structure factors
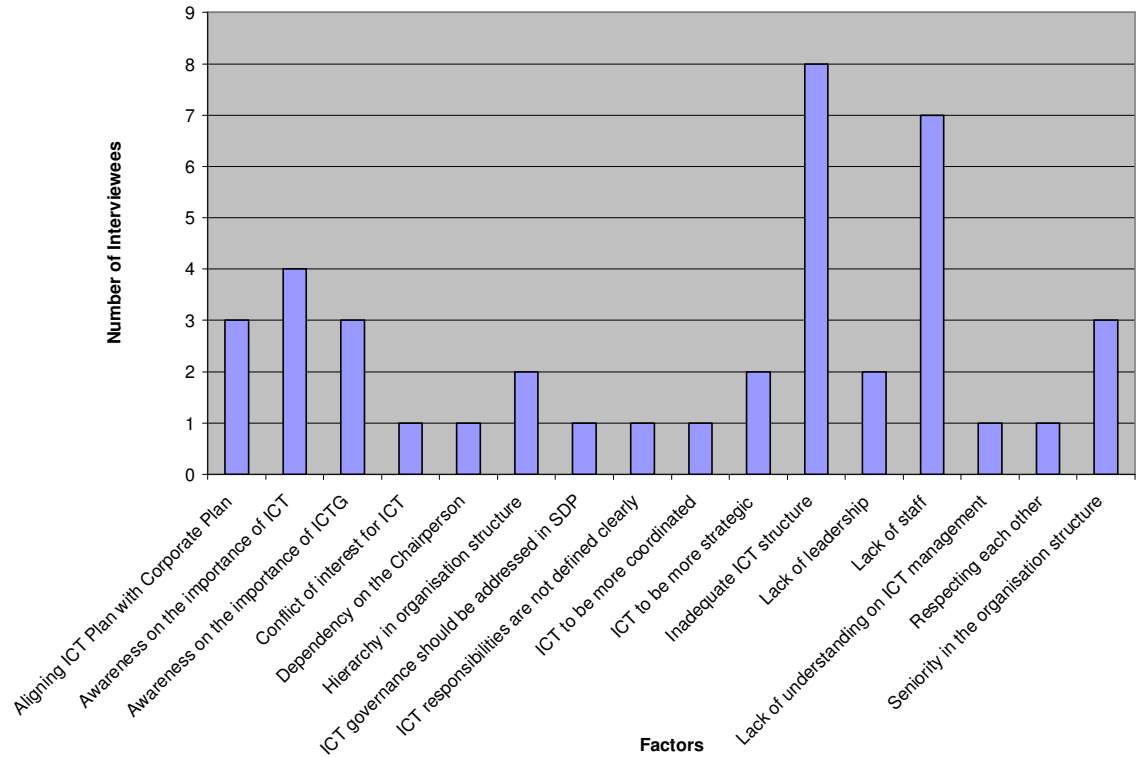
Figure 4. 5: Structure Factors Chart
(Source: Author, 2009)

The chart above demonstrates that the most commented factors by interviewees are the inadequate ICT structure, lack of staff, awareness on the importance of ICT, aligning ICT plan with corporate plan, awareness of the importance of ICTG, and seniority in the organisation structure. These factors indicate that they might be the most influencing factors in the structures focus area in ICTG of the Ministry which require strong attention of both ICT and HOD committee. ICT and HOD should review these factors on how these factors can be enhanced to improve the effectiveness of ICTG implementation in the Ministry.

4.4.1.5 Summary of structure factors

The tree representation figure 4.6 summarizes the factors that influence structure mechanisms identified above. The structure factors tree nodes model is an extraction from NVivo software.

Figure 4. 6: Structure Factors Tree Nodes
(Source: Author, 2009)

4.4.2 Processes

This section reports and describes the process mechanisms that were found from the field research in sub section 4.4.2.1. In sub section 4.4.2.2, the reported process mechanisms are summarized through a tree nodes model extracted from the NVivo software. The factors that influence the implementation of these process mechanisms are also identified and described in sub section 4.4.2.3. Sub section 4.4.2.4 presents the factors found in a chart with respect to the number of interviewees who commented on each factor. Sub section 4.4.2.5 summarizes the factors found that influence process mechanisms through a tree node model extracted from the NVivo software.

4.4.2.1 Process Mechanisms

This section describes the process mechanisms found in the field research. These process mechanisms will be described in the following order from sub section 4.4.2.1.1 to sub section 4.4.2.1.5 consecutively: ICT project approval process, ICT support services process, ICT budget preparation process, funding request process, and ICT procurement process.

4.4.2.1.1 ICT Project Proposal Approval process

One of the process mechanisms that exist in the ICTG of the Ministry is the processes for an ICT project. ICT projects proposals (ICTPP) could be initiated from either the ICT division or the other divisions within the Ministry. In fact, all ICTPP should be linked with the objectives in ICT AMP and Ministry's corporate plan. For example, the upgrade of the Ministry's accounting management systems called the Sun System was initiated from Treasury division because they were the main users of the system. According to the response from interviewee I that

> *"the upgrade of Sun System, this was a direction from the Chairperson to upgrade the Sun System and then IT acted on it. The direction came may be from his meetings with other divisions such as treasury who uses the Sun System. May be they reported to him their requirement to upgrade the system or it might be a consultant came over and advised him about the upgrade."*

So, in this case the ICTPP had been submitted and approved by the Chairperson and a direction was forwarded to ICT to implement ICT project. All ICTPP should be forwarded to ICT for further assessment in accordance with ICTPP checklist. Although a direction from the Chairperson was issued, ICT still had to conduct the assessment part on that ICTPP. According to Interviewee B that

> *"If there is an IT project then it will be directed first to IT for technical inputs from their side like its soundness and capability for they have their own checklist to test the technical features of IT. From there, they will have to look at the cost and benefit analysis to ensure that the task that they are about to perform is more economical, sustainable, and also check the capability inside whether it can carry out this task. So these are the things that they should look at."*

In contrast, some ICTPP were initiated by ICT where they had to prepare the ICTPP and submitted to either the Director or to the HOD meeting for approval. All ICTPP should be discussed with ICT and the Director. For example, the upgrade of the Ministry's network infrastructure by purchasing new servers and routers, this ICTPP was initiated by ICT and discussed with Director before submitting to HOD meeting for discussion and final approval. Interviewee I stated that

> *"IT proposal can also be discussed in the HOD like our latest new infrastructure it went up to the HOD and presented to them to get some feedback but most had no feedback."*

If there were feedback from HOD then the ICTPP would have to be amended and resubmitted. Otherwise, the ICTPP would be finalized for approval by the Chairperson. Due to the fact that head of ICT is the acting senior manager of corporate service division, ICTPP were submitted directly to the Director, otherwise, ICTPP would have been first discussed with the senior manager of corporate service before submitting to the Director.
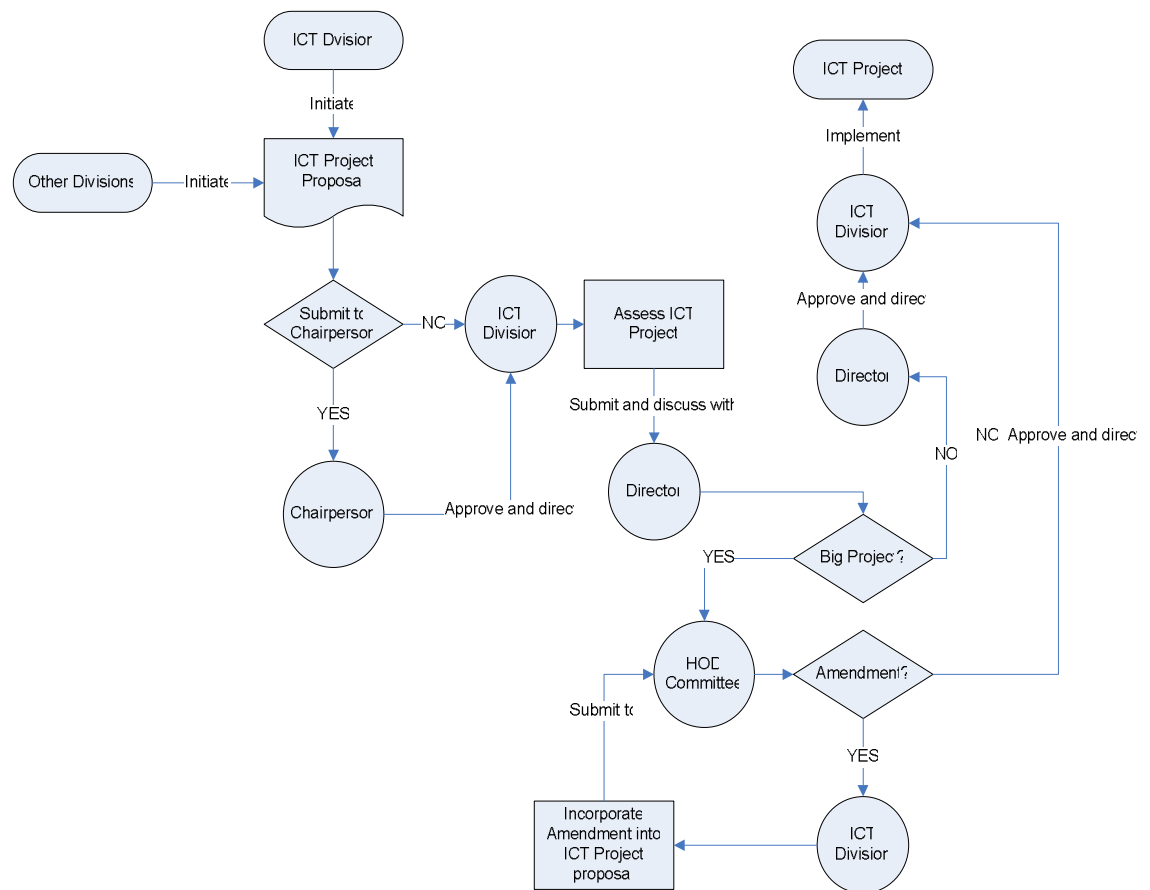
Figure 4. 7: ICT Project Proposal Approval Process
(Source: Author, 2009)

For some of the major ICTPP of the Ministry like the one that they are planning to implement which is the devolving of the Sun System to other ministries and departments, a working committee is established to administer that project. The structure of the working committee will be described later in sub section 4.4.3.1.6,

however, the ICTPP will have to go through the working committee to the HOD committee for approval.

For purchasing of computers, it would only require the approval of the Director whereas major ICTPP would be required to be submitted to HOD meeting via the Director. A summary of the ICTPP approval process is demonstrated in figure 4.7 above.

4.4.2.1.2 ICT Support services process

ICT has designed and implemented a support service framework to cope with the ongoing support services for end-users in the Ministry. ICT implemented a single contact center for ICT support needs called the "Help Desk". The Help Desk will be further discussed later in this chapter but in the mean time, help desk is the responsibility of all personnel in the ICT division to attend to. Help desk is the first contact point in ICT for ICT support needs. The ICT support process is divided into three tiers. The first tier is the help desk, second tier is the support staff, and the third tier consists of the specialist depending on the type of ICT issue.
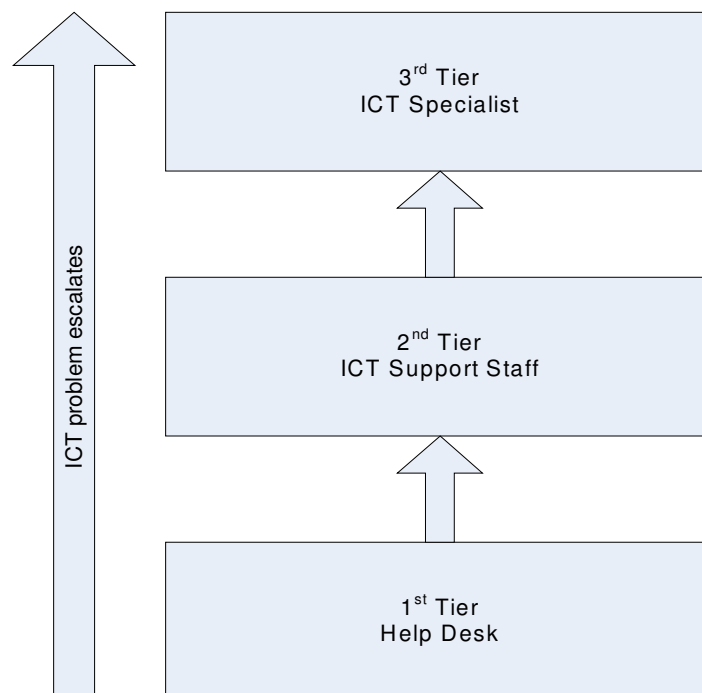
Figure 4. 8: ICT Support Structure
(Source: Author, 2009)

These three tiers are structured in a vertical hierarchy form, and the attendance of

relevant tier to ICT issues will depend on the escalation of the ICT issue if the issue cannot be resolved by the first attended tier. The structure of help desk is demonstrated in figure 4.8 above. More detail on the process of ICT support is shown in the response from Interviewee I below:

> *"The idea is that when some calls with a problem then just call the help desk and see if help desk can resolve that issue. There is no staff who specifically assigned for help desk role for we are under staff currently. So there is no one here who is treated to be the helpdesk person but there is a phone number for helpdesk which is not required to be left unattended. It must be answered by someone. While our staff are working around the Ministry, someone must carry the telephone here for this is the first tier. The second tier is the support officers which are in the same unit and they are the ones who attend and check your computer for what might be the solution for the problems. If this problem cannot be solved there then it escalates depending on the types of problems. If the problem is related to software then it is redirected to the application unit and if the problem is related to infrastructure then it is redirected to that unit. Users do not recognise these things but these are within us. There is only one point of contact which is the helpdesk. So there is no need for you to know who is responsible for Sun System and that. You just call and report the problem and someone will attend to it. So when someone calls with a problem it will be log and he will be informed that someone will attend to that problem. This is so that the end-user does not have to call everywhere looking for someone to come. There is only one point to be contacted and log the problem. That is the benefit of help desk so that you can just call and report the problem and we have discussed and I have created some steps like... if there is a problem that always arises then it is the responsibility of that section to train the support staff on the solution for this problem or provide some guide questions that they can attend to and if the problem escalates they have done part of the process...that part about the network to check if the network is working or not and so on."*

In addition to the process implemented above for ICT support in the Ministry, ICT also provided training to end-users on simple problems to be checked before contacting ICT for help. Such simple problems like unconnected network cables,

unplugged power cables, or disconnected mouse or keyboard. By doing so, it minimizes the load on ICT for support as there are insufficient staff in ICT to accommodate all ICT support needs of the Ministry.

4.4.2.1.3 ICT Budget preparation process

The head of ICT had to prepare a plan for ICT including ICTPP and all requirements from ICT for the next financial year and brought forth through the senior manager of corporate service division in the HOD meeting during the budget consultation period. The budget consultation period is presumably about five to six months before the end of the current financial year. Interviewee J stated that

> *"In this time, IT should bring forth their plan for their projects for next year and then we will have look at the whole Ministry and prioritise these projects that are required by each division and prioritise their needs."*

4.4.2.1.4 Funding request process

There are two major funding sources for ICT. One comes from internal funding from the Ministry's annual budget and the other comes from external funding sources such as donor funding from Australia and New Zealand. With respect to the internal funding request process, ICT has to raise their funding requirement with the budget division of the Ministry and check for any sufficient fund available. If there are insufficient fund available in that particular operational account then ICT will liaise with budget division in looking for available fund in other relevant operational account to be transferred to the operational account where the purchase order will be issued from. Normally, all ICT requirements for the current year that were allocated in the budget would have sufficient fund available except for the unexpected ICT requirement and major ICT projects that require large fund arise during the current financial year. Once the status of funding is confirmed, ICT will then submit the ICT requirement or ICTPP to the Director for approval. Interviewee I stated that

> *"we just consult the Director or we just contact directly to budget division and cc to the Director. The Director must approve all our requirement but we first consult with budget if there is fund available and then from there*

to the Director. If there is no fund available then we inform the Director and seek his direction."

On the other hand, the process for acquiring funding from external funding sources takes longer for it goes through a longer process. ICT has to raise their funding requirement and ICTPP with the Director and then submitted the ICTPP to the Aid and project management division given that the Director approves the ICTPP to proceed. Aid and project management division is responsible for seeking funding for funding requests from all ministries and departments. They are the contact point for donors. According to Interviewee F that

> *"From donors' perspective, the Aid management is the one who takes care the requests from Ministries that seek funding for their projects."*

Furthermore, all funding requests will be channeled through the Project Advisory Coordination Committee (PACC) which is chaired by the Chairperson of the Ministry and secretariat by the Aid and project management division. Interviewee G reported that

> *"Any funding request from Ministries will have to come through the PACC one. The refers to any funding requests on anything such as for community and IT funding and all that, they have to go through PACC."*

Interviewee G also stated that funding requests from the Ministry would be in advantage because the chairperson of PACC is from the Ministry. This also increases the chance of obtaining funding for ICT funding requests from the Ministry.

While the responsibility of seeking external funding sources rest with the Aid and project management division, some of the aid programs are supplied directly to some ministries such as Food and Agriculture Organisation (FAO) is provided specifically to the Ministry of Agriculture.

Once the ICTPP is received by the Aid and project management division, then Aid and project management division consult with relevant donors to fund the ICTPP. According to Interviewee F, that Aid and project management division has

> *"a project proposal format that is distributed to Ministries and then the Ministries submit it to Aid and project management division and then Aid and project management division would look at the guidelines of each donor whether it is NZ Aid, AusAid or any other donor to check who can*

accommodate this project proposal in according with the goals and objectives of each donor."

So, ICTPP has to be aligned with the objectives of donors in order for donor to approve funding for ICTPP. Interviewee F also stated that donor may approve to "fund the whole project or they can just fund only part of it."

4.4.2.1.5 ICT Procurement process

ICT procurement process was activated only when purchase of ICT equipment was required. There is a procurement division in the Ministry which is responsible for administering and enforcing the procurement policy of the Ministry including policy for ICT procurement. Such ICT procurement policy like the one stated by Interviewee H as

> *"There is also a procurement policy of the government that determines the minimum number of supplier that are required to provide quotes. There are ranges that determine the minimum number of quotation like $500-$1000 requires at least two quotations. More than $1000 requires at least three quotations."*

ICT procurement can be initiated by ICT or end-users but all ICT procurement requests should come through ICT. ICT will then submit the ICT procurement request to the Director for approval through the senior manager of the corporate service division. For example, when a computer is required to be purchased, ICT will have to assess and identify the ICT requirement and send out request to computer suppliers for quotations on the computers. Once these quotations are received then they will be submitted to the Director for approval. According to Interviewee H, "After evaluating the quotations then we prepare a memo and submitted it to the Director." Interviewee H continued to say that once the approval of the Director is obtained "a purchase order request will also be filled out if the Director approves it and submitted it together with this form to Treasury division" for payment. Interviewee H reminded that the budget for the ICT procurement should be confirmed with the budget division before proceeding with purchasing of ICT equipment.

In addition, Interviewee G recommended that

> *"procurement should be added to the channel even though they complain*
> *about it but its a way we ensure that we are paying for the value for money*
> *on those equipment that are procured into the Government."*

According to comment from Interviewee G above, by having the procurement policy in placed put some controls on the expenses of ICT and making sure that ICT procurement are in line with the goals and objectives of the Ministry.

4.4.2.2 Summary of Process Mechanisms

The tree representation figure 4.9 summarizes the identified processes mechanisms described above. The processes mechanisms tree nodes model below is an extraction from NVivo software.
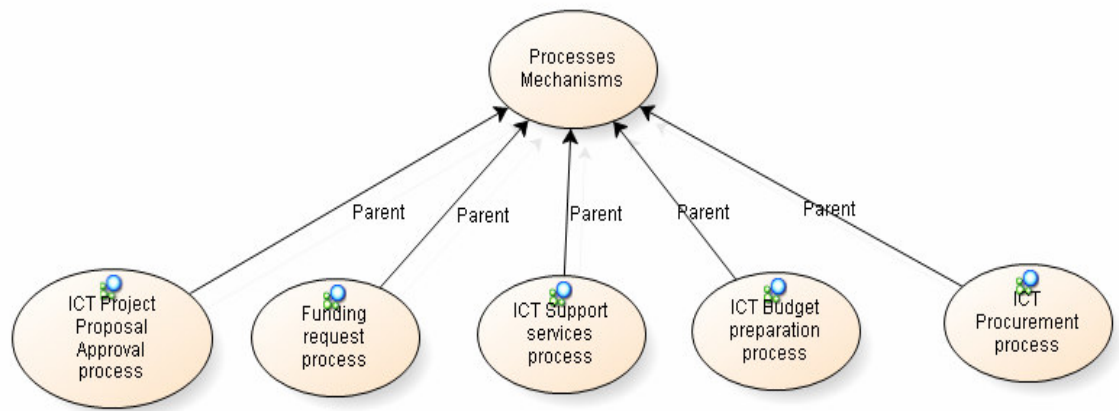
Figure 4. 9: Processes Mechanisms Tree Nodes
(Source: Author, 2009)

4.4.2.3 Factors influencing Process Mechanisms

This section describes the factors that influence process mechanisms found in the field research. These factors are described in the following order from sub section 4.4.2.3.1 to sub section 4.4.2.3.10 consecutively: lack of funding, lack of documentation and instructions, outdated information, lack of commitment from ICT, lack of commitment from executive management, outsourcing of ICT projects, human errors, wide distribution of process, wide scope of ICT services, and gender.

4.4.2.3.1 Lack of funding

The lack of funding is identified to be a major factor in implementation of ICTG given the limited sources of funding within the Ministry. Normally for ICTPP that involve substantial amount of funds like more than $10,000 pa'anga, the ICTPP will have to be referred to the Aid and project management division for funding request. Interviewee D reported that ICT proposed "that there are lots of things that they would like to implement but somehow constraint could be funding". Interviewee A identified a lot of ICTPP to be implemented such as the devolution of the financial management system – the Sun System and

> *"the link to the ministries will also increase the number of licenses per end-users which is to be paid to facilitate their access to the Sun System. So these are the things that we are planning to do and funding is also required for this."*

Interviewee G also reported that one of the ICTPP was on hold due to funding issue. The project was called the Government of Tonga Network (GoTNET) where all ministries and departments were supposed to be connected together through a central network using fiber optic cables. According to Interviewee G,

> *"it was hanging because the issue was funding. It was all been supported but it was handed over to funding to prepare the costing for the project and it always end up to funding. But it was given to them to get the costing of what the total cost would likely be for this project before proceeding with funding."*

Moreover, Interviewee J said that he struggled to get a replacement for his broken computer because of the constraint in ICT budget but he ended up getting a new computer through a project with aid funding.

4.4.2.3.2 Lack of documentation and instructions

The lack of documentation and instructions is found to be the most reported factor from interviewees that influences the implementation of ICTG in the Ministry. Some of the responses from interviewees indicated that there was lack of documentation in ICT and similarly with other divisions in the Ministry. Likewise, when the researcher asked for manual or written policy in ICT, ICT replied that most of ICT policies were still in their outstanding tasks. Interviewee H reported the lack of documentation in ICT by saying that

"Things that are lack here are no written policy like for computer usage, email, and related matters to this division. At the moment there is no written policy for the Ministry."

Interviewee I also agreed that

"Our policy has not been documented and same for any manual like a computer end-user's policy or policy for connection to us and these are included in the matters that are still outstanding from our section to be completed in the future."

Similarly with other division of the Ministry according to Interviewee F that

"Most of the processes are not documented and currently likewise in the treasury section we don't have treasury instructions and that is one thing we are trying to do is to produce some instructions and currently constantly remind every time to everyone in treasury to document their work."

However, Interviewee A stated that "there is a need to write up some manuals and instructions manual and procedures manual." Some of these manuals and instructions such as ICT disaster and recovery plan, ICT policies, ICT manual, ICT security policy are required to be in placed in ICT to improve the governance of ICT. Interviewee A continued to stress the importance of this issue that

"I don't really know if there is an IT disaster plan existed but these are required to be in placed for the preparedness of the Ministry."

4.4.2.3.3 Outdated information

The outdated information is found to be another factor in ICTG implementation in the Ministry which means that some ICT manuals were in placed but they are not updated. For example, the website of the Ministry (www.finance.gov.to) still publishes some information that are out of date such as the organization structure. The organization structure chart published on the website is different from the organization structure chart found in the document (The Ministry of Finance Organisation Structure, n.d.). Although the date does not appeared in the Ministry's organization structure's document, the Ministry confirmed that the document is the latest version of the Ministry's organization structure. Not only that, but there was a consistency found in the objectives of the ICT provided in the corporate service AMP (Annual Management Plan, n.d.) and the objectives listed

in the Ministry's corporate plan (Corporate Plan for 2007-2010, 2007).   The corporate service AMP provided three objectives under section 3.3 Objectives: Information Technology and Management Division which are: to facilitate the core functions and responsibilities of the Ministry, develop and manage the Ministry's IT infrastructure, and provide a systems development service for the Ministry.   In contrast, five objectives listed under section 3.3 Objectives: Information Technology and Management Division in the Ministry's corporate plan which are: develop a strategic support system, improve IT infrastructure services and its reliability, clear classification of IT roles and responsibilities, increase IT awareness and computer literacy with the Ministry, and facilitate the core functions and responsibilities of the Ministry.   It demonstrates the lack of regular and timely update of the information in the Ministry.

Furthermore, Interviewee A showed doubt on the update of the information in ICT by saying that "I believe that they have manuals in placed but I do not know whether these manuals are updated regularly or not."   Interviewee A went on and stressed the need for ICT to update the information and necessary ICT equipment of the Ministry as shown below:

> *"But I believe that these are required and IT have to check these things and make sure that they update the things that are required to be updated."*

4.4.2.3.4 Lack of commitment from ICT

The lack of commitment from ICT when providing support services to end-users is found to be a factor influencing ICT services process in the Ministry which means that sometimes when ICT provides support to end-user's ICT issues, the issue either becomes worst or left unsolved.   Sometimes ICT support staff informed end-users that someone else would attend to the issue but they never came to fix that issue.   This sort of response from ICT indicates the lack of commitment from ICT from the perspective of end-users.   According to Interviewee D, he reported that

> *"when they come it is either worse it is not fixed or something being done and they have to go back for someone else and no one comes back."*

Similarly, Interviewee G commented that ICT

"tend to do their work in their own comfort zone and not knowing that we have been frustrated over here 'cause we want more things done but I mean that their follow up is in progress but just reporting back that is the most important thing so to assure us that Yes, there is improvement or No, we cannot do anything we have to get you a new computer or anything like that in small problems like that."

Interestingly, Interviewee G stated that ICT usually "do their job but may be that everyone is just ignorant." The response indicates a lack of commitment from ICT on some of end-users' ICT issues. ICT is slacking in responding back to end-users with the progress of their ICT issues leaving dissatisfaction in end-users' minds with ICT services.

4.4.2.3.5 Lack of commitment from executive management

Some of the responses from interviewees reflected that there was lack of commitment from executive management on the initiatives from ICT which shows that executive management is reluctant to commit to ICT initiatives resulting on delays on ICT initiatives. The lack of commitment from executive management is one of the factors that affects the process of ICT projects. For example, Interviewee H said that ICT had put forth a proposal for a new organisation structure for ICT but he did "not know whether it has been approved or not, or they might just say yes and yes" but no action on the proposal. Thus, ICT reported that the proposal for the new structure had not been approved and had not been raised again in the agenda of HOD meetings.

Similarly, Interviewee I reported that

"every project it is required to be not really a milestone for the milestone it is reported but they just browsed it through and they do not do anything".

Again, the response from the Interviewee I indicates that executive management is not fully committing to the initiatives from ICT for they just browse through the projects instead of concentrating on the projects more and make effort to contribute through discussion and providing feedback to the project.

The support of executive management is a critical factor to the success of the processes in ICT projects. By having the support of executive management, it will help to speed up the process of ICT projects as well as making the process of

getting funding for ICT projects easier.

4.4.2.3.6 Outsourcing of ICT projects

The outsourcing of some of ICT projects is sometimes identified to be a dilemma. According to the response from the interviewee B that "some previous experience that the external supplier and support for the system were not good." The external vendors were probably not committing or delivering the expectation of the Ministry. However, this matter became a major concern to the executive management of the Ministry and Interviewee B suggested that "when a project is sourced externally again, an agreement should be important and very understandable" which indicates that the Ministry needs to put better control and measurement mechanisms when outsourcing ICT projects.

Given that outsourcing of ICT projects is a challenge, it might affect the process of ICT projects as well by imposing second thoughts when executive management makes decisions on ICT projects. On the positive side, this challenge awakes the Ministry to ensure that better control and measurement mechanisms such a service level agreement (SLA) and balance scorecard are in placed for ICT projects.

4.4.2.3.7 Human error

The human error while using computer systems is a factor that affects the ICT services process in the Ministry. The human error refers to wrong entries by end-users while using the information management system such as Sun System resulting in discrepancies in the output. Interviewee F said that "The system in itself is OK but it is the actual input like sometimes you can't really differentiate the wrong journal type that makes the error." The response shows that the issue comes from the end-users instead of the systems. If the end-user inputs wrong data then wrong information will be output. Some end-users do not want to take the blame for the wrong output and cast the errors on the systems.

However, when an issue is reported to ICT regarding wrong output from the systems such as Sun System, ICT investigate the actual data during input for ICT believe that data input is the main cause of the problems as Interviewee F said that "it is more to do with human error. This is the error from input". The

data input causes errors in the system's output such as "the discrepancy on reports but the IT in itself is fine" according to Interviewee F.

4.4.2.3.8 Wide distribution of process

The wide distribution of process refers to the number of channels that ICT has to go through before ICT get the result in which some processes consist too many channels. According to Interviewee F that in some processes "you have to go over there and then take it over there to get approval." The wide distribution of process is identified as a factor that affects some of the processes in ICTG in the Ministry. For example, the process for donor funding request for ICT projects which has been described above whereby the funding request proposal has to go from ICT through the senior manager of corporate service to the Director and then to HOD meeting. From the HOD meeting, ICT projects are handed over to the Aid and project management division and then to the PACC. The process takes a lot of effort, time, and requires patient. However, Interviewee F suggested "to streamline the process so that the processes are not widely distributed".

4.4.2.3.9 Wide scope of ICT services

It is evident from the responses of interviewees that the scope of the services of ICT is not confined to the Ministry only, instead, ICT provide services to other ministries and departments as well. According to Interviewee F,

> *"IT people are not only supporting Ministry but also some of the other departments like Information public department and Statistics Department."*

Similarly, Interviewee D responded that ICT was

> *"not only that they cater for the Ministry but sometimes from outside - other government ministries that they usually require their assistance and their skills".*

However, ICT recently started to stand their ground and informed the Director that they do not have the capacity to support all other ministries and departments. As a result, Interviewee H reported that

> *"when the Director directs us we then response that our staff is not enough to do that job. Before, when they called us we attended to it.*

There were quite a lot of ministries for us to support but it is now reducing down to few departments such as the pubic enterprise and statistics."

4.4.2.3.10 Gender

The research finds that gender becomes a minor factor in the communication of ICTG which is reflected from the response of one of the interviewees where he stated that male staff are easier to work with than female staff. The response shows that there is resistance from female staff and negative responses from female staff on ICT services. According to Interviewee I that the negative responses and resistances from female staff

> *"become a barrier to how to we work especially to female staff. Male staff are easy to approach and they accept our advices and methods that we provide."*

The gender factor affects the services provided by ICT according to the response above. Although the reasons for the resistance from female staff are still not defined, the gender factor is still important to address and consider while implementing ICTG to ensure that all factors are recognized so that ICTG can be implemented successfully in the organisation.

4.4.2.4 Graph representation of Processes factors

The chart in figure 4.10 demonstrates that the most commented factors by interviewees are the lack of funding, lack of documentation and instruction, lack of commitment from ICT, wide scope of ICT services, lack of commitment from executive management, and outdated information. Evidently, these factors indicate that they are the most influencing factors in the processes focus area in ICTG in the Ministry which require strong attention of both ICT and HOD committee. ICT and HOD should review these factors on how these factors can be enhanced to improve the effectiveness of ICTG in the Ministry.
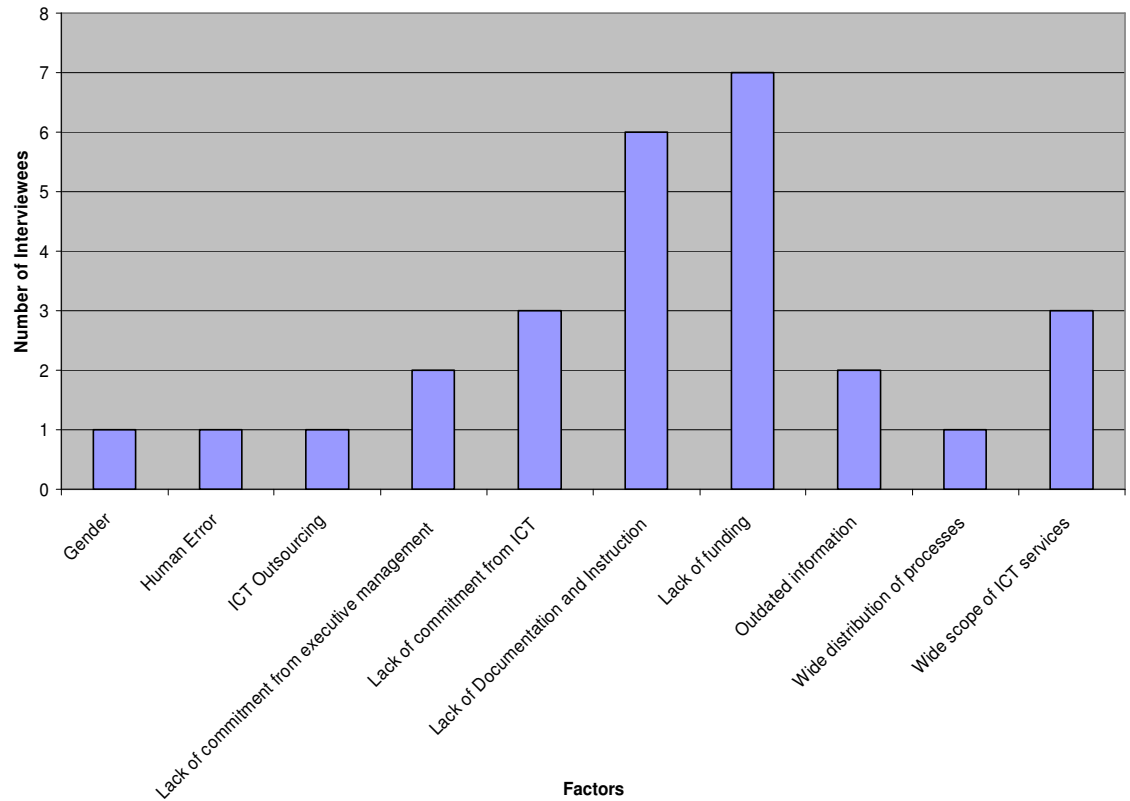
Figure 4. 10: Processes Factors Chart
(Source: Author, 2009)

4.4.2.5 Summary of Processes factors

The tree representation figure 4.11 summarizes the identified factors that influence processes mechanisms described above. The processes factors tree nodes model is an extraction from NVivo software.
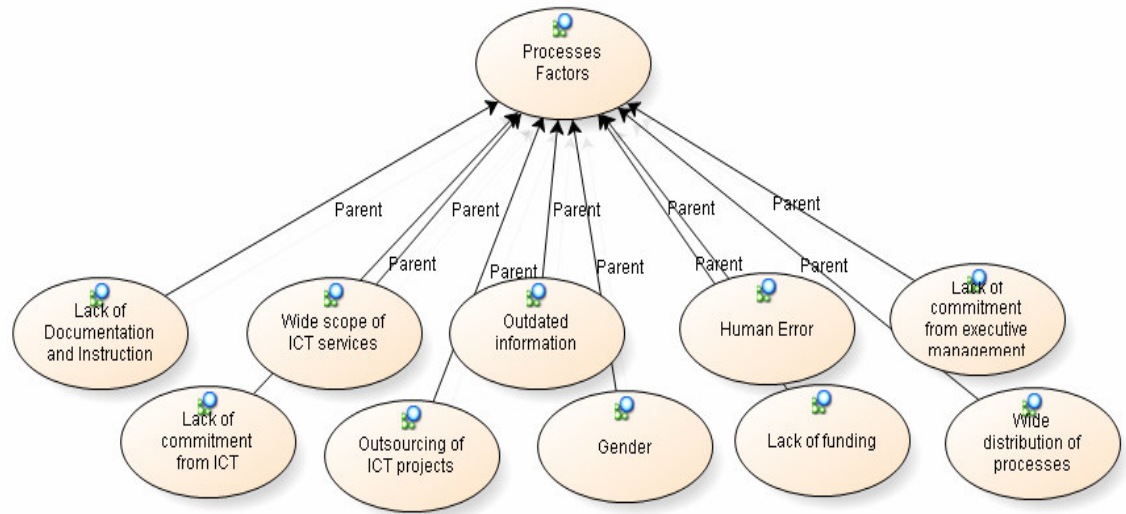
Figure 4. 11: Processes Factors Tree Nodes

(Source: Author, 2009)

4.4.3 Communications

This section reports and describes the communication mechanisms that were found from the field research in sub section 4.4.3.1. In sub section 4.4.3.2, the reported communication mechanisms are summarised through a tree nodes model extracted from the NVivo software. The factors that influence the implementation of these communication mechanisms are also identified and described in sub section 4.4.3.3. Sub section 4.4.3.4 presents the factors found in a chart with respect to the number of interviewees who commented on each factor. Sub section 4.4.3.5 summarises the factors found that influence communication mechanisms through a tree node model extracted from the NVivo software.

4.4.3.1 Communication Mechanisms

This section describes the communication mechanisms found in the field research. These communication mechanisms are described in the following order from sub section 4.4.3.1.1 to sub section 4.4.3.1.7 consecutively: email and telephone, help desk, HOD meeting, training, Director's weekly meeting, working committee, and divisional meeting.

4.4.3.1.1 Email and telephone

The email and telephone are the most common tools for communication in the Ministry. The email and telephone are used by ICT for communication within ICT division or between ICT and end-users which indicates that computer awareness in the Ministry is widely acknowledged. A lot of responses from interviewees preferred email rather than telephone while some interviewees still preferred the traditional tool – the telephones for communication. According to Interviewee F that within their section, they "constantly communicate through emails. Most of the reports and stuff are distributed through emails." Similarly, Interviewee G said that

> *"We just used email a lot. The only problem with that is that once your email is down you could not get across your demand then you can use the phone but then the phone sometimes when we call them its usually busy but I think the problem is might be from our side."*

The downside of email is that email relies on the continuation of the operation of the network system and power system. If one of them fails then email will not be operating. On the other hand, the downside of telephone is the availability of the telephone line for communication. If someone is on the telephone then you cannot use the telephone at that particular time. Unlike email, you can just type your messages and send those messages to the recipient. Another issue with email is that, the sender is not sure whether the recipient has received his email or not. Apparently, the responses from interviewees indicate that email becomes a habit for end-users to check their emails on regular basis. So the recipient will definitely receive the message whenever. As Interviewee J stated that "normally we communicate with IT through telephone and email." Likewise, Interviewee H agreed that "we just normally use email and telephones." Interestingly, one of the interviewees said that she does not really use telephone because they are located close to each other. According to Interviewee F, he said that "We don't really use the phone as we are close to each other".

4.4.3.1.2 Help Desk

The Help desk is also identified as one of the effective communication mechanisms in ICTG in the Ministry. The structure of help desk has been described earlier. Help desk has a dedicated telephone number and email for end-

users to contact to for ICT support needs. As Interviewee H stated that "Help desk can be contacted using email, telephone or just come in person to us. There is a specific email and telephone for helpdesk." As mentioned earlier that help desk is the first contact point of ICT. According to Interviewee C, "IT has setup a help desk and we can just call that number if we face with any technical problem." In addition, Interviewee I said that "Help desk and support were also set up so that they are the first line or the first tier of support". Likewise, Interviewee H commented that "all of their needs, problems, and requests should come through the helpdesk". Help desk is supposed to be attended by ICT immediately at all times and the responses from interviewees confirmed that ICT has been very effective with the Help desk. Help desk should never be left unattended by ICT.

4.4.3.1.3 HOD meeting

The HOD meeting is found to be another communication mechanism in ICTG. The structure of HOD committee has been described in previous section where members of the HOD committee are consisted of all the senior managers and the chaired by the Chairperson. The core purpose of the HOD meeting is for senior managers to report and update all members in the HOD committee on the progress of the work in individual division. However, this is where ICT can report and convey the progress of ICT projects and work in ICT to the HOD through the senior manager of corporate service. According to Interviewee E that

> *"HOD meeting is more or less just to update each other on the progress of each division's work and to brief the Chairperson and the Director on the status of where things are in terms of our work towards our annual management plan."*

Likewise, Interviewee E said that

> *"HOD meeting for that is where all the heads meet and that is where we are been briefed by the head of divisions on the issues from their division."*

4.4.3.1.4 Training

Training is found to be a mechanism that helps ICT communicating with end-users for various purposes. ICT can provide training for end-users on how to use a particular software application. For example, Interviewee I said that

"We also provide training to the staff. We just completed our training on the email for we are now shifting to MS Exchange which was just deployed."

Usually, this sort of training is conducted whenever a new software application or system is launched according to the response from Interviewee C below:

"The training of users is usually carried out when a new system is introduced such as the email in which the server was changed and we were all trained on that."

Similarly, Interviewee D said that ICT

"will train my staff on having standard template instead because that there are a lot of work like editorial and putting of the statement, but I think that one of the things that they want to train the staff to have a standard one so they won't have to join the team in staying overnight."

In fact, training helps ICT to minimize the need for ICT to physically present in the end-users site and troubleshoot the problems. The end-users should now well aware of how to trouble that software application or system. From the point of view of ICT, training reduces the load on their support and making them available to attend some other tasks.

Training can also be used by ICT to educate end-users on how to properly use a software application or a system to minimise the issues with that software application or system that caused by end-users. Training will also help reducing the issues reported to ICT regarding end-users' difficulties with using the software application or the system given the lack of staff in ICT for support. Hence, training benefits both the end-users in terms of learning and ICT in terms of supporting. According to Interviewee I that

"This is to help the staff and also for us as well. The more the staff know the system the lesser problem that we will face."

4.4.3.1.5 Director's weekly meeting

Every Monday of the week at nine o'clock in the morning, the Ministry starts its working day with a meeting. The meeting is the Director's meeting and the Director is the one who calls and leads the meeting which is usually with a prayer. All staff of the Ministry should participate in the meeting. According to Interviewee B, the purpose of the meeting is for the Director to

"inform staff about the matters that are going on within the ministry regarding with important issues of the Nation and also just to meet with the staff and raise any other matters."

In addition, Interviewee E said that head of divisions can raise any matter of concerns during the Director's meeting and also allows any staff to raise any issue of concern to the Director or staff. Basically, the Director's meeting is for the Director to communicate with all staff of the Ministry.

However, ICT can use the Director's weekly meeting to raise any issue of concern from ICT which are required to convey to staff.

4.4.3.1.6 Working committee

Evidently, the working committee is another communication mechanism in the ICTG of the Ministry. According to Interviewee C, the Ministry is planning to devolve the Sun System to all the ministries and departments of Tonga as a new project for 2009. In doing so, each ministry will be responsible for managing their own financial account instead of merely done by the Ministry. The Ministry will then just monitor the ministries and departments account and ensure that they all comply with government financial management policy. However, Treasury division is collaborating with ICT in establishing a working committee to manage the project. The members of the working committee were not specified but the interviewees indicated that members would come from senior staff of both Treasury and ICT divisions.

4.4.3.1.7 Divisional meeting

The divisional meeting is where each head of division calls and leads a meeting with the senior staff or all staff of that division. So, each division has their own divisional meeting at various periods. For example, one division responded that they "meet once in every week with the head of division." The purpose of the divisional meeting is for the staff of that division to report on the progress of their work in accordance with their AMP. Also in the divisional meeting, staff can raise any issues of concern within the division or other division. Thus, if they have issue with ICT they can report the issue in the divisional meeting. The head of that division will then raise that issue in the HOD meeting. If the matter can be

resolved between the head of that division and the head of corporate service division then they would just call a meeting to discuss the matter.

Apparently, most issues with ICT from other divisions were normally communicated through email or telephone according to the responses from interviewees. Practically, there is no scheduled meeting called for ICT but only when they are required by that division like Interviewee F said that they "don't meet regularly but I guess it is on adhoc basis." Despite tre lack of meetings with ICT, some interviewees acknowledged that having a meeting with ICT would be a good approach to improve their relationship with ICT and making sure that ICT is delivering their expectation. According to Interviewee G that

> *"we normally communicate through emails and there have never been any meetings but that would be very helpful if it is for the problems that come up daily."*

4.4.3.2 Summary of Communication Mechanisms

The tree representation figure 4.12 summarizes the identified communication mechanisms described above. The communication mechanisms tree nodes model below is an extraction from NVivo software.
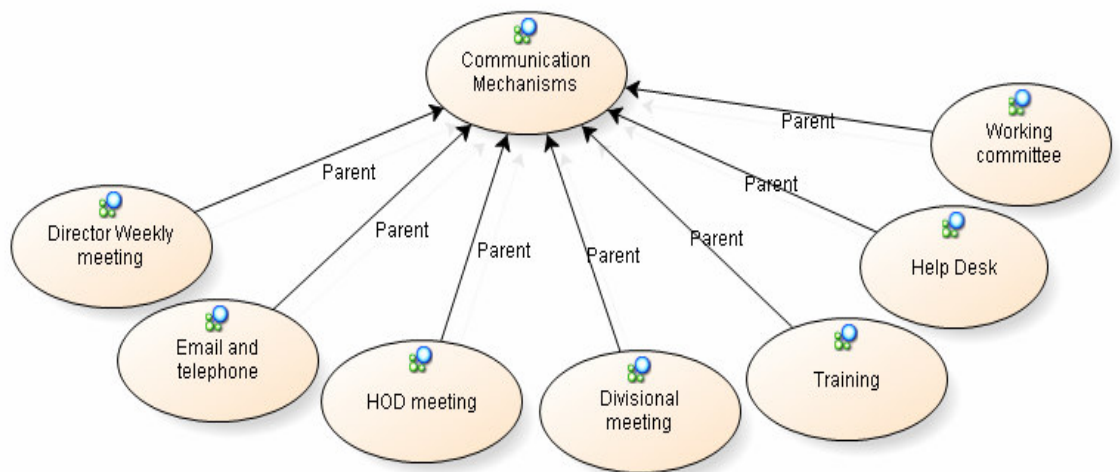
Figure 4. 12: Communication Mechanisms Tree Nodes
(Source: Author, 2009)

4.4.3.3 Factors influencing Communication Mechanisms

This section describes the factors that influence communication mechanisms found in the field research. These factors are described in the following order

from sub section 4.4.3.3.1 to sub section 4.4.3.3.13 consecutively: collaboration between ICT and end-users, executive management supports ICT, wrong perspectives on the roles of ICT, ICT is mostly reactive, lack of updates from ICT to executive management on ICT projects, lack of communication between ICT and end-users, lack of ICT training for end-users, lack of change management, misunderstanding between ICT and end-users, lack of training for ICT staff, trust in ICT services, end-users' lack of ICT knowledge, and end-users' satisfaction with ICT services.

4.4.3.3.1 Collaboration between ICT and end-users

The collaboration between ICT and end-users is an important factor for the successful implementation of ICTG in the Ministry. It is evident from the responses from interviewees that end-users are willingly support ICT, thus, this good relationship is required to maintain and continue in the future. The treasury division recognizes the significant of ICT to the operation of the Ministry and they would like "to collaborate with IT as it might be that the function of IT is the main thing in us for it is starting to centralise everything" according to Interviewee C. Interviewee C further commented that treasury division would like "to set up a committee together with IT to talk about devolution" of the financial management system as the upcoming project of the Ministry. By forming the working group for the project, it will improve the relationship between treasury and ICT whereby the communication barrier is broken down and allowing both parties to share ideas. The working group also ensures that ICT is delivering the expectation of treasury and on the other hand, treasury is providing the necessary requirement for ICT as well. Interviewee C said that

> "We are planning now but we should be working together closely with IT to look at how we could improve our work especially when it comes to devolving the system to other ministries. The information and IT must be reliable and ready."

The collaboration of ICT and end-users is also evident in the budget division whereby they work together with ICT and treasury in the preparation of the staff list which includes government staff's salary, names, and necessary details to be submitted to parliament. The work involves reconciliation of data from budget, treasury and ICT. According to Interviewee G, budget division

"have data on that, treasury have data on that and IT have data on that. Most of the times, these data are not matched. So what we do with that we put it together to be able to reconcile these data."

Interviewee D also said that they also collaborate with ICT on preparing the budget statements during the budget preparation for the next financial year.

4.4.3.3.2 Executive management supports ICT

It is very important that ICT gets the support of the executive management on their ICT initiatives. The research found that ICT is getting support from members of the executive management such as the Director. For example, if ICT have issues to raise in the HOD meeting but HOD meeting is deferred due to unavailability of the Chairperson then the Director can willingly discuss these matters with ICT and if necessary, the Director might also approve the ICT issue. Interviewee B said that they

"have a HOD meeting with the Chairperson which is usually conducted weekly but sometimes it is postponed due to lot of work but at the same time if there is anything that IT require then they would come and discuss it with me."

The Director also supported ICT projects in searching for funding sources. Interviewee B said that the Director found some funding available in one of the aid funded projects in the government and the Director informed ICT to apply for that funding.

In addition, Interviewee B said that "for technical assessment, I rely on IT people that we look at the cost and benefit of the tasks to be performed." Not only that ICT is getting support from executive management members but executive members are relying on ICT to perform their tasks to meet the requirement and expectation of the Ministry as well.

Another indication of the support from executive management is the support from the Chairperson on ICT projects. Interviewee G stated that one of the ICT projects was called GoTNET whereby all ministries and departments were connected to a single network and ICT "did a proposal for that one and the response from the Chairperson was very supportive."

ICT projects are usually discussed in the HOD meeting to get their feedback like Interviewee H said that

> *"IT projects are usually raised in HOD and sometimes there are projects that were directed from the Director for us to action on it. But mainly we discussed things in HOD and get their comments."*

The feedbacks from HOD members are valuable for the successful implementation of ICT projects and ensuring that ICT meet the expectation of the Ministry.

One of the ICT projects was the upgrade of the financial management system – the Sun System which was very supported by the Chairperson and HOD members whereby a direction from the Chairperson to ICT to implement the upgrade. So, this project became top priority for ICT. According to Interviewee I, ICT prepared a proposal for the project "and submitted directly to the Chairperson. The project proposal process was easy because it was pre-approved by the Chairperson to upgrade the Sun System."

However, the research finds that acquiring the support of executive management is a crucial factor in communicating ICTG in the organisation. This factor is also crucial for the effectiveness of ICT project process in terms of speeding up the process and obtaining the necessary approval.

4.4.3.3.3 Wrong perspectives on the roles of ICT

The perspectives of executive management and end-users on the roles of ICT are a crucial factor in the relationship between ICT and end-users in the Ministry. Unfortunately, the executive management and most end-users have a very technical view on the roles of ICT and its importance to the Ministry. From the point of view of executive management, ICT plays a supporting role to the Ministry. According to Interviewee C that "the view from HOD about IT is just a support service to the operation" and "at the moment they still have that view that IT is just a support service or an enabler." Interviewee D argued that ICT "always play a role of supporting role to the Ministry". Interviewee H also agreed by saying that

> *"I believe that currently most have wrong views that IT is people who just fix and support computer problems. I believe that this wrong view also applies to other divisions as well".*

In addition, the research found that ICT is not really in the top priority in the Ministry's agenda. Some of the ICT projects should be in top priority for the

Ministry but they were not. For example, Interviewee H reported that ICT proposed to replace or upgrade the backup power generator of the Ministry but the proposal "was raised in the HOD and since I discussed this in the HOD which is how many years now from then", there was still no progress on the proposal. That proposal should be a top priority project to the Ministry to ensure the continuity of its operation in the event of power failure because "when the power is off there will be no work to do" according to Interviewee H.

On the other hand, Interviewee A suggested that "it is also vital to consider the view of IT on themselves and how they view themselves and their function." The view of ICT on themselves is crucial and to ensure that others have the same view on them too. But this view should be reflected on the roles that ICT play and also how active is their performance in the Ministry.

In spite of the above, Interviewee A said that

"this perspective is required to be changed to be more strategic in how IT view themselves and also the same with how executive view IT. This is so that IT can prepare and plan to go together with the executive plan."

The view on ICT should be more strategic in terms of aligning the objectives of ICT plan with the plan of the Ministry. ICT should be more involved in the executive management and take lead in providing ICT solutions for the Ministry's initiatives. In doing so, the link between ICT and other divisions in the Ministry become more effective and more productive in terms of working together as a team towards achieving the goals and objectives of the Ministry.

4.4.3.3.4 ICT is mostly reactive

The research found that ICT is mostly reactive with their roles and approaches to achieving the goals and objectives of the Ministry. This means that ICT only respond when they are required to attend an issue rather than planning and doing something to prevent that issue from occurring. According to Interviewee A,

"If IT only concentrates on support, then IT will be reactive at all times. So, whenever they are required to do something, IT will then react to that."

The ICT is mostly reactive factor is co-relation with the factor of the perspectives on the role of ICT whereby ICT is required to be more strategic instead of acting just being a support role to the Ministry. Similarly Interviewee C reported that

> *"The only thing that I think to be improved in our relationship with IT, it is like that I feel that they are not active enough but this does not mean that they do not want to work together with us. They are open for us but we have to arrange a meeting to look at the issues with IT and it is required for us to be more proactive with our approach."*

In addition, Interviewee D said that

> *"the steering committee has not been reactivated where it should be so the Director as everyone - the members they have their own agenda but it has to go back to the head of IT to put it forth in terms of things to work and put through and they have to be more active themselves and take the lead."*

However, ICT is required to be more active with their communication and relationship with other divisions by having informal meetings instead of just waiting for issues to be reported. ICT also has to be more proactive with their initiatives such as the proposal to establish the ICT steering committee to be followed up on the progress of that significant issue and ensure that the proposal is approved.

On the other hand, Interviewee I agreed that "We are mainly reactive but not really proactive because we are still under staff and we have limited resources." Although ICT is mainly reactive, the cause of this factor reported here is due to lack of staff. Thus, it is shown here that there is a correlation between this factor and the factor of lack of staff identified previously.

However, Interviewee A emphasized again the importance that "IT is required to be proactive." Interviewee A said that "I believe that IT is required to be more proactive in providing trainings on their related areas". Interviewee B also responded that

> *"it is stated in our corporate plan about the significance of IT to be extremely proactive. It is also vital for IT to not just reactive to problems."*

Given the above, ICT is required to be proactive in accordance with the corporate plan through prudent planning and exploiting appropriate communication mechanisms such as trainings and meetings in performing their roles in order to achieve the goals and objectives of the Ministry.

4.4.3.3.5 Lack of updates from ICT to executive management on ICT projects

It is important for ICT to inform the executive management members on the progress of ICT initiatives regularly. Interview A emphasized the importance that "IT is also required to interact with executive". The interaction can be done formally through the HOD meetings or informally through adhoc meetings at the Director's room or having lunch together. But usually, according to Interviewee I, "the executives are informed and reported to during the HOD on the progress of a project." For example, Interviewee I reported that the Ministry's "latest new infrastructure, it went up to the HOD and presented to them to get some feedback". Again Interviewee I said that

> *"We just noticed lately when a project is prolonged there is nothing to show the executives about the progress of the project. So it is keyed in to the mind of the executives that if they won't ask for something then there would be no job to do. So when a project is long termed the executives are usually not aware about the progress of that project. But the executives are informed and reported to during the HOD on the progress of a project."*

Hence, it is evident from the response of interviewee I above that HOD members are not regularly updated on ICT initiatives which may create negative perspectives and lack of support from HOD members on ICT initiatives.

However, instead of waiting for the HOD meetings to take place where ICT usually update HOD members on the progress of ICT initiatives, ICT should just drop by in HOD members' rooms for informal discussion on ICT issues. By doing so, ICT will get the confident and support of executive management on ICT initiatives. The HOD meetings are also sometimes postponed due to the unavailability of the Chairperson. Amazingly, ICT is improving on this factor. According to Interviewee I, ICT update HOD members frequently through a report "called 'quickprint'. So in every week we need to demonstrate something to the executives and they will say oohh they did something."

4.4.3.3.6 Lack of Communication between ICT and end-users

The research found that there was lack of communication between ICT and end-users including executive management members as well. Interviewee A said that

"I don't really know much about how IT being operated in the Ministry." Again Interviewee A said that

> *"Like I mentioned earlier that I don't really know much about the current structure of IT, their systems and programs or even the manual about security and all, I do not know."*

Thus, the response from Interviewee A indicates a lack of updates from ICT on ICT initiatives to the HOD members. In fact, the close communication between ICT and HOD members is very crucial for the successful implementation of ICTG in the Ministry. ICT should get the support of HOD in order for their initiatives to move forward and for ICTG to be effective in the Ministry.

Furthermore, the lack of communication between ICT and end-users is also evident when ICT launched the implementation of the financial management system – Sun System of the Ministry according to the response from Interviewee B below that

> *"the people who own the system came and did their demonstration and said that here is the system - this is the capability and the kind of reports. But it should be tested and management team should be involved a lot from the users' side of it to make sure what the sort of layout of kind of reports of the output from that side so that it can be tested against the system whether the system can provide it."*

The response above shows that HOD members and end-users were not really involved in the process of the designing and implementing the system. The HOD members are the crucial for ICT projects as they should be more involved in ICT projects. ICT should update HOD members more frequently when an ICT project is implemented to ensure that all stakeholders are aware and also ensure that the project meets the requirement of the Ministry.

Moreover, there is a lack of responds from ICT on end-users reported ICT issues. Interviewee G reported that

> *"Although tickets from help desk are working but I think that the only break down in communication is the rare respond back to us on a regular basis on the status of problems in step by step."*

Thus, ICT should be more coordinated and active on this matter by informing end-users on the progress of the reported issues. There are various communication mechanisms which can be utilized for the communication

between ICT and end-users such as email and telephone. By keeping the end-users satisfied is an indication of good ICTG.

In contrast, ICT was not involved in the discussion of one of the proposed ICT projects by one of the divisions. Instead, ICT received a direction from the head of the Ministry to implement the project. According to Interviewee I,

"The direction depends may be from his meetings with other divisions such as treasury who uses the Sun System. May be they reported to him their requirement to upgrade the system or it might be a consultant came over and advised him about the upgrade."

Hence, by not involving ICT during the proposal phase of the project reflects a reluctant from other divisions and also lack of communication between ICT and other divisions as well. ICT is crucial to the success of the any ICT project right from its initiation. Any ICT project that is initiated by other division should be discussed with ICT first to get their feedbacks before pursuing the necessary approval.

Interestingly, ICT have already realized the lack of communication between ICT and other divisions according to Interviewee H that

"This is something that we usually discussed about, that there is problem with the link between IT and senior management including the link between IT and HOD and link between IT and other divisions."

Thus, ICT should not rest on that but to further pursue with finding resolutions to improve the communication issues between ICT and other divisions through regular and close communication with executive management and end-users to improve the link between ICT and other divisions in the Ministry.

4.4.3.3.7 Lack of ICT training for end-users

The research found that lack of ICT training for end-users is a factor that influences ICTG communication mechanisms in the Ministry according to some of the responses from interviewees. Although ICT training was carried out in the Ministry, but ICT training was not on regular basis. Instead, ICT training was only carried out when a new system or software application was deployed. Thus, according to Interviewee E, "that it is still very important that training is ongoing always." Training is also a concern from executive management as Interviewee D

stated that "that is the prerogative that the Director notes and always put forth to the IT people for training." Interviewee D also added that

> "the only thing that Director would like to encourage them to training for the local for the IT people to train the staff in the ministry not only in here in Tongatapu but also in the staff in the outer islands."

Such training like

> "in terms of in general on basic computer like how to use computers because a lot of features in computers some of the staff they are not aware of it even like the email I think most staff especially in the outer islands as well they don't even know how to use email probably because they haven't use computers."

ICT training can also be conducted on one-on-one basis for "some staff can't take so much at once" according to Interviewee F. ICT training is more preferred by end-users than reading the user manual. The end-users have the chance to experience how the system or software application is used. Interviewee E commented that

> "who would want to read those manuals. It's very unfortunate that I miss out the training. But I think that this is the best way to look at how it is operated rather than to read the manuals."

Furthermore, ICT training should be conducted for new recruits in the Ministry to show them the policies and procedures of the Ministry such as ICT policy while using computers. As reported by Interviewee J that

> "Over here, when you come in, they assume that you know everything. I think that there should be an induction programme including some manual on how things are done or an IT policy on what to do or not to do while using computers for the new staff."

4.4.3.3.8 Lack of change management

The research found that lack of change management in ICT when a new system is deployed is a factor that influences ICTG communication mechanisms in the Ministry. ICT deploys the new system without clear consultation with end-users on the possible impact of the new system on them and their work. For example, ICT recently launched a new email system which required changes to some of staff email addresses. ICT standardized all staff email addresses by combining

the first letter of their first name together with their last name to become their new email address without informing the staff. According to Interviewee D, ICT

> *"went along and changed the email without bringing forth to the HOD meeting. So I think that is an issue that brought up recently and there were few disappointments about that."*

The lack of change management resulted in dissatisfaction from end-users on ICT services and products. As reported by Interviewee D that "there were few of the staff complaining about that that this very inefficient." Furthermore, Interviewee D said that

> *"consultants in our division were very unhappy recently with that....one of our consultants raised is that IT people that they are the one implementing those things but the decision making to change anything should be rest with the HOD."*

The response from Interviewee D shows that ICT implemented the changes without first informing HOD. However, ICT should be very careful in managing changes in the ICT systems of the Ministry to minimize the negative effects on end-users and the operation of the Ministry.

Similarly, ICT did not inform end-users when they made changes to their computers. According to Interviewee E, that

> *"when I came and resumed on Monday I think that they get a transfer of all my stuff to another system like from Office 2003 to 2007. When I came I looked at my screen and it looks different to me. All the stuff that I have on my desk is not there. And I was trying to search around to where about are my stuffs."*

As a result, the end-user was struggling in finding his files from his old computer. This issue would also create negative perspectives and dissatisfaction on ICT services from end-users.

More communication should be conducted by ICT with end-users through trainings and meetings to ensure that HOD and related end-users are aware of any ICT change. ICT should also prepare resolution to challenges that might occur during the changes.

4.4.3.3.9 Misunderstanding between ICT and end-users

The research found that misunderstanding between ICT and end-users on some of

the services provided by ICT is another factor that influences ICTG communication mechanisms in the Ministry. The misunderstanding is evident from the relationship between ICT and treasury division whereby treasury always blames ICT for the issues related to Sun System. As reported by Interviewee I,

> *"if there are something related to application like the Sun System – if there is a problem about the limitation of the application, the response from them is that they blame IT for being lack of understanding on their part on how to use the system."*

ICT received the blame for not knowing how to use the system while the issue was due to limitation of the capacity of the application is one example of the misunderstanding between ICT and end-users.

Another example is that ICT had informed end-users to contact Help Desk for any related ICT issues. Yet, Interviewee H said that some end-users

> *"still call directly to us, senior staff to come and fix their printer or something. These duties have been delegated to other people. Sometimes we told them to call the helpdesk and sometimes I just attend to their problems."*

However, the misunderstanding between ICT and end-users can be improved by "having more training and informal talk with them" according to Interviewee I.

4.4.3.3.10 Lack of training for ICT staff

Although ICT is performing their roles with great professionalism, but from the perspective of end-users, ICT still need more trainings and experiences to improve their performance. Interviewee D recalled that "the head of IT also attend one of the training in UK with regards on that management." However, more training should also be offered for the new ICT recruits. As said by Interviewee D that ICT

> *"have some new recruits right now but I guest they also need training. They are good and qualified they went study and have degree under IT but you know how it is, it always a different story what you study but you have to come in and take more years of experience."*

According to the response from Interviewee D, working in the organisation in reality is different from mainly theory at school. Thus, a new recruited qualified staff is not guaranteed that he knows everything in the Ministry immediately,

unless he works in the Ministry for few years to gain necessary experiences and trainings. So, training can help fast tracking the experience of new recruited staff in ICT in their professions.

4.4.3.3.11 Trust in ICT services

Trust is identified to be a factor influencing ICTG communication in the Ministry. Earning the trust and confident of end-users on the services provided by ICT helps improving the relationship between ICT and end-users. ICT should trust that end-users will use ICT systems responsibly in accordance with its purposes and policies. On the other hand, end-users should trust that ICT will always be there for them whenever they face ICT difficulties and also confident that ICT have adequate capacities to provide the necessary ICT services. The confident is demonstrated by the compliment from Interviewee D that the "Ministry IT people is the only one that are really good - I mean that they know what they are doing". Moreover, Interviewee F said that "IT itself is OK. I think that trust…if I won't trust the data from the system; it is more to do with human error." The response from Interviewee F indicates that errors in ICT systems are mostly caused by end-users rather than the systems. However, end-users need to trust and have confident that the systems are helping them with their work rather than blaming the systems for output errors or such issues.

Furthermore, ICT should be acted professionally and ethically without breaching any privacy issues to earn the trust and confident of end-users. According to Interviewee D,

> *"IT people should be trustworthy cause we believe that IT people can view anything …our staff we don't trust we see like our email and using the word "email" sometimes it is not reliable to send because the leakage of the information and we know that IT people can view what your emails are. So that is the mentality in us."*

However trust is an important factor in ICTG communication but with close communication between ICT and end-users through trainings, meetings, and commitments in ICT services will earn the trust and confident of end-users.

4.4.3.3.12 End-users' lack of ICT knowledge

ICT can do their best in performing their roles in the Ministry but with lack of ICT knowledge in end-users will not help them improving their ICT services. However, ICT needs to address this factor and provides resolution to it. The lack of ICT knowledge in end-users is evident from the response of Interview E that

> *"If there is anything for them to do, it might be partly because that I have lack of knowledge on the things that they know about which is a shortfall from our side."*

Interviewee E further admitted that "there are lots of things that I am not familiar with on how to use those things" with computers. The response from Interviewee E shows that Interviewee E needs more basic trainings on ICT. The more literacy of end-users in ICT, the easier will be for the support services from ICT.

Furthermore, Interviewee G reported that his staff are not really communicating with him through emails. Instead, his staff report to him face to face. Thus, Interviewee G prefers using of email as he is not always in his office. Interviewee G also commented about the new features in email that his

> *"staff can make use of these features but it is like that it is just one way at the moment for they are not responding and sharing their calendar or even update me on the stage of their work for there is one you can assign task to them and it goes to the same page to check its progress but you still wait for them to reply but they don't."*

The response from Interviewee G indicates the lack of knowledge from end-users on how to use emails.

However, ICT is required to provide more training on ICT to improve the skills and knowledge of end-users. ICT training will also benefit ICT services as well by having less issues reported by end-users.

4.4.3.3.13 End-users' satisfaction with ICT services

Despite the factors identified previously that affect the communication between ICT and end-users, the research found that end-users were relatively satisfied with the services provided by ICT. Some end-users were satisfied with the help desk system created by ICT as reported by Interviewee C that "it is good that IT has setup a helpdesk and we can just call that number if we face with any technical problem." Similarly, Interviewee E said that

"we email to them through helpdesk, they respond immediately or you just call them and then they are here. And then after that you receive an email saying that the complaint you submitted, it has been taken care of."

Some end-users also satisfied with the support services and respond rates from ICT on ICT issues as Interviewee C reported that "IT is good for when I call them about a problem someone will immediately attend to it." Interviewee E agreed that "from my own understanding on how they response currently, it seems to me that they are doing a good job." Interviewee E was amazed with the respond rate from ICT even though ICT is located in a different location apart from where he is located by saying that

"I am amazed with their respond especially that we are not in the same location. Cause they are located over there and we are over here."

Likewise, Interviewee F reported that

"Regarding the performance of IT, for me as soon as I call them on a problem if they are busy then they will inform us that someone will come over in 5 minutes. But usually when I call them there is someone has to attend and if they can't fix it right there and then they will tell me to get it fixed in the afternoon. If it is something to do with the system sometimes they would say that they need to do something from the server which would be done after work. Satisfactory is very good."

Furthermore, some end-users were satisfied with the training provided by ICT according to the response from Interviewee D below:

"It has been really good, recently they conducted a training for the staff a movement to the new outlook email. So they conduct training for all the staff on how to use some of the features. So it was really good."

Some members of the HOD are satisfied with the update report from ICT during HOD meeting. As said by Interviewee E that

"usually in the number of meetings that I have been to it has been very good on the things that have been briefed from IT under the corporate services....the head of corporate service so he has been updating the meeting on the issues related to IT and that division."

However, by having these acknowledgements from end-users is part of the indication of how ICT perform in the Ministry. These responses will also help ICT to encourage the services that are supported by end-users while improving

those services that are criticised by end-users. The satisfaction of end-users can also be improved if ICT executes appropriate communication mechanisms such as training, emails and telephones in communicating with end-users. By doing so, ICT will definitely improve its relationship with end-users.

4.4.3.4 Graph representation of Communication factors
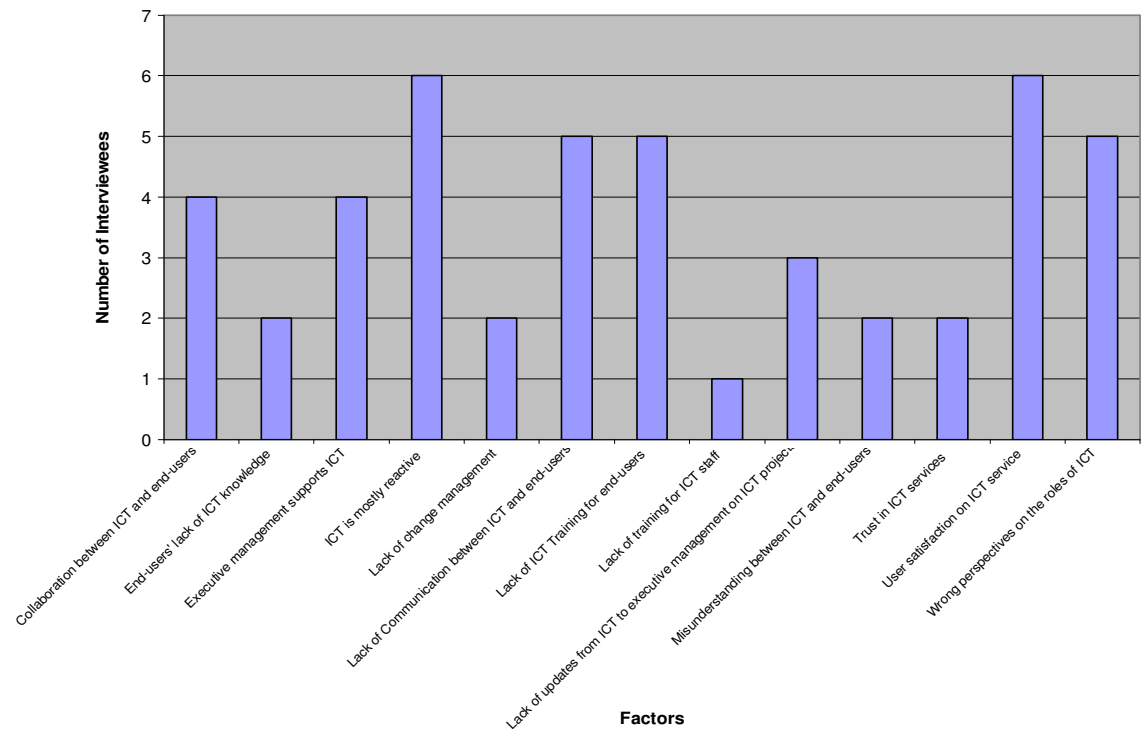
Figure 4. 13: Communication Factors Chart
(Source: Author, 2009)

The chart above demonstrates that the most commented factors by interviewees are ICT is mostly reactive, user satisfaction on ICT services, lack of communication, wrong perspectives on the roles of ICT, and lack of ICT training for end-users. These factors indicate that they might be the most influencing factors in the communication focus area in ICTG in the Ministry which require strong attention of both ICT and HOD committee. ICT and HOD should review these factors on how these factors can be enhanced to improve the effectiveness of ICTG in the Ministry.

4.4.3.5 Summary of Communication factors

The tree representation figure 4.14 summarizes the identified factors that influence communication mechanisms as described above. The communication

factors tree nodes model below is an extraction from NVivo software.
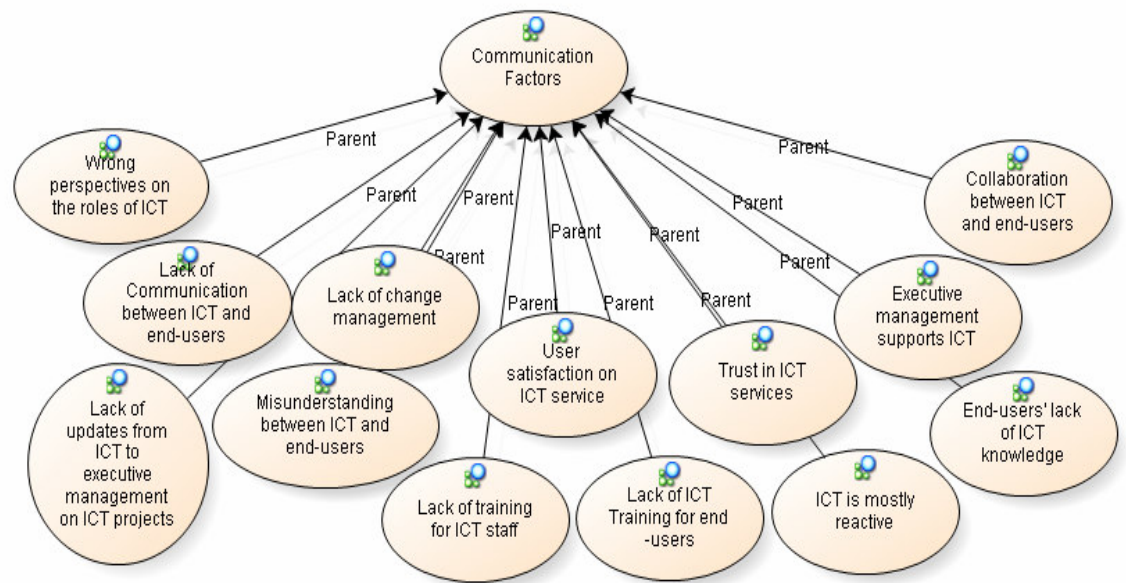
Figure 4. 14: Communication Factors Tree Nodes
(Source: Author, 2009)

4.5 Conclusion

In conclusion, this chapter has reported the findings from the research by first reporting the issues and challenges faced by the researcher accessing the data for the study. These matters have importance as each impacted on the plan for data collection defined in Chapter 3 from theory. The main issues and challenges faced by the researcher during the research were the research ethics application approval process, access to the case, lack of funding for the research, disruption of the availability of interviewees, scattered location of the interviewees, and limited time for the research. Moreover, mechanisms and factors for each of the three focus area in ICTG: structures, processes, and communications found in the research were identified and described. These ICTG mechanisms and factors are summarised in table 4.2.

ICTG Focus Areas	Mechanisms	Factors
Structures	- ICT organisation structure - HOD committee - ICT Steering Committee - Internal Audit Committee - ICT budget - ICT governance model - Roles and Responsibilities - Strategy Plan	- Inadequate ICT structure - Hierarchy in the organisation structure - Seniority in the organisation structure - Respecting each other - Conflict of interest for ICT - Lack of staff - Dependency on the Chairperson - Aligning ICT Strategy Plan with Corporate Plan - ICT to be more strategic - ICT to be more coordinated - ICT governance should be addressed in SDP - ICT responsibilities are not defined clearly - Lack of leadership - Lack of understanding on ICT management - Awareness on the importance of ICT - Awareness on the importance of ICTG
Processes	- ICT Project Proposal Approval process - ICT Support services process - ICT Budget preparation process - Funding request process - ICT Procurement process	- Lack of funding - Lack of Documentation and Instruction - Outdated information - Lack of commitment from ICT - Lack of commitment from executive management - Outsourcing of ICT projects - Human Error - Wide distribution of processes - Wide scope of ICT services - Gender
Communications	- Email and telephone - Help Desk - HOD meeting - Training - Director's Weekly meeting - Working committee - Divisional meeting	- Collaboration between ICT and end-users - Executive management supports ICT - Wrong perspectives on the roles of ICT - ICT is mostly reactive - Lack of updates from ICT to executive management on ICT projects - Lack of communication

		between ICT and end-users
		▪ Lack of ICT Training for end-users
		▪ Lack of change management
		▪ Misunderstanding between ICT and end-users
		▪ Lack of training for ICT staff
		▪ Trust in ICT services
		▪ End-users' lack of ICT knowledge
		▪ End-users' satisfaction with ICT services

Table 4. 2: ICTG Mechanisms and Factors Summary

(Source: Author, 2009)

The research also identifies the most commented factors from the ICTG focus areas: structures, processes, and communications as demonstrated in table 4.3.

ICTG Focus Areas	Most Commented Factors
Structures	▪ inadequate ICT structure ▪ lack of staff ▪ awareness on the importance of ICT ▪ aligning ICT plan with corporate plan ▪ awareness of the importance of ICTG ▪ seniority in the organisation structure
Processes	▪ lack of funding ▪ lack of documentation and instruction ▪ lack of commitment from ICT ▪ wide scope of ICT services ▪ lack of commitment from executive management ▪ outdated information
Communications	▪ ICT is mostly reactive ▪ user satisfaction on ICT services ▪ lack of communication between ICT and end-users ▪ wrong perspectives on the roles of ICT ▪ lack of ICT training for end-users

Table 4. 3: Most commented factors in ICTG implementation Summary

(Source: Author, 2009)

Chapter 5 now discusses the findings of Chapter 4.

Chapter 5
Discussion of Findings

5.1 Introduction

The findings of the research have been reported in chapter 4 according to the requirements specified in chapter 3 (subject to the declared variations). In chapter 5 the findings are to be discussed by comparing the report of chapter 4 with the theoretical predictions elaborated in chapter 2. The literature review indicated that there is a robust literature on best practice and guidelines for implementing IT controls. In chapter 4 some of these practices were apparent, some were not and there were others that were outside of the literature reviewed in chapter 2. The discussion is structured to reconcile the differences between the theory and the results found in practice, and to provide an evidential response to the research question.

Chapter 5 is structured to compare, contrast and discuss the findings. Common ideas are looked for, differences located, and an educated attempt made to construct guidance for best practice of ICTG implementation in organisations. This chapter also recommends best practices derived from the findings which can assist the organisation with the implementation of ICTG. In section 5.2 the ICTG frameworks found in chapter 2 are compared with the ones found in the research. In section 5.3 the comparison of the mechanisms is made to evaluate theory with practice for the main ICTG focus areas of structures, processes, and communications. This leads to formation of common elements as framework for developing mechanisms. Section 5.4 compares the factors that influence ICTG implementation found in chapter 2 against the factors found in the research. These factors are then classified as enablers and inhibitors. The causes of the factors found that influence ICTG implementation are described in section 5.6. Section 5.5 discusses the relationship between the factors found that influence ICTG implementation and ICTG. Section 5.7 provides some of the recommended practices developed from these findings to assist an organisation in implementing effective ICTG and conclusion is drawn in section 5.8.

5.2 ICTG Frameworks

In chapter 2, it is noted that there are various frameworks that have been developed to assist with the implementation of ICTG in the organisation. These frameworks are COBIT and Val IT framework developed by ITGI, ITIL developed by OGC, and COBIT CMM adopted by COBIT. The purposes and details of these frameworks have been described in chapter 2.

In comparison, the research finds that ICT in the Ministry is not using or adopting any of these well known international frameworks. Instead, ICT is adopting a model found from a book by John Baschab and Jon Piot called "The Executive's Guide to Information Technology". ICT has recently restructured their organisation structure according to the model proposed by Baschab and Piot. The current structure of ICT is demonstrated in figure 4.1 where it is divided into two main sections: infrastructure and application. The responses from ICT state that this structure improves the performance of their services in the Ministry. From this book, ICT learned the significance of establishing of an ICT steering committee to the governance of ICT in the Ministry. ICT also designed the idea of help desk from this book to improve the support services of ICT to the Ministry.

Although ICT in the Ministry has adopted a model from a book which seems to be working well for them but it is still very important for them to explore the benefits from proven international ICTG frameworks such as COBIT and Val IT to ensure that mechanisms in placed for implementation of ICTG in the organisation are appropriate and measurable. Adopting proven international ICTG frameworks will also allow ICT to have external support from experts in ICTG when required. Although there is no single ICTG framework that can fit all organisation requirement but at least ICT is adopting a framework that have been used in most organisations and proven to be working successfully. ICT is not necessary to adopt the whole mechanisms provided in these international frameworks but only the parts that are applicable to the Ministry. But most importantly is to ensure that ICT is supporting the goals and objectives of the Ministry.

5.3 Mechanisms for ICTG implementation

In chapter 2, it was found that there are three main mechanisms for the implementation of ICTG in the organisation based on the studies by Weill and Ross and Van Grembergen and De Haes. These mechanisms are structures, processes, and communications and these are the focus areas in ICTG. There are various mechanisms within each focus area. These are summarised in table 5.1.

ICTG Focus Areas	Mechanisms
Structures	- centralised or decentralised ICT department (Broadbent and Kitzis, 2005) - hybrid ICT department (Broadbent and Kitzis, 2005) - Outsourcing of ICT services while maintaining its core support services of business functions (Broadbent and Kitzis, 2005) - six archetypes – business monarchy, ICT monarchy, feudal, federal, ICT duopoly, and anarchy (Weill and Ross, 2004) - CIO reports to executive committee and executive committee reports to board of directors but CIO is not a member of the executive committee (De Haes and Van Grembergen, 2005).
Processes	- ICT investment project approval process (Weill and Ross, 2004) - New ICT project process (De Haes and Van Grembergen, 2005) - Project tracking (Weill and Ross, 2004) - CMM (De Haes and Van Grembergen, 2005) - Balance scorecard (De Haes and Van Grembergen, 2005) - Formal tracking (Weill and Ross, 2004)
Communications	- senior management announcement (Weill and Ross, 2004) - formal committee like an ICT steering committee (Weill and Ross, 2004; De Haes and Van Grembergen, 2005) - training and educating through web-based portals (Weill and Ross, 2004) - training and educating through internal magazines (De Haes and Van Grembergen, 2005)

Table 5. 1: Summary of ICTG Focus Areas and Mechanisms from Literature

(Source: Author, 2009)

The research finds various mechanisms implemented in the Ministry within each ICTG focus area. A summary of these mechanisms is provided in table 5.2.

ICTG Focus Areas	Mechanisms
Structures	▪ HOD Committee ▪ ICT budget ▪ Internal Audit Committee ▪ ICT governance model ▪ ICT organisation structure ▪ ICT Steering Committee ▪ Roles and Responsibilities ▪ Strategy Plans
Processes	▪ Funding request process ▪ ICT Budget preparation process ▪ ICT Procurement process ▪ ICT Project process ▪ ICT Support services process
Communications	▪ Director Weekly meeting ▪ Divisional meeting ▪ Working committee ▪ Email and telephone ▪ Help Desk ▪ HOD meeting ▪ Training

Table 5. 2: ICTG Focus Areas and Mechanisms from Summary
(Source: Author, 2009)

In comparison, there are some similarities between the mechanisms found in chapter 2 and the mechanisms found in the research. First is the discussion of the similarities in ICTG structures. The research finds that ICT in the Ministry is structured as a centralised ICT department similar to that reported by Broadbent and Kitzis (2005) where all its ICT human resources are grouped into a single division within the Ministry. This is evident from the Ministry organisation structure whereby all ICT employees are employed within the ICT division.

With regards to outsourcing of ICT services presented by Broadbent and Kitzis (2005), the research finds that the Ministry is adopting the mechanism. The Ministry is outsourcing its financial management system, the Sun System to overseas vendor while ICT provides the day to day support for Sun System. ICT also provides support services to the Ministry and maintain and manage the ICT infrastructure and applications of the Ministry.

Furthermore, the Ministry is found to be adopting structures similar to the business monarchy and IT duopoly archetypes described by Weill and Ross (2004). The HOD committee of the Ministry is an example of business monarchy archetype where all heads of divisions in the Ministry are involved in making

decision for ICT projects. The head of ICT is also participated in the HOD committee for he is currently in charge of the corporate service division. However, ICT reports to HOD committee through the head of corporate service. On the other hand, IT duopoly archetype is also used frequently in the Ministry. The head of ICT usually discuss their initiatives with the Director such as obtaining his approval to purchase new computers. The proposed ICT steering committee of the Ministry is also a good example of IT duopoly where the head of ICT and some of the head of other divisions are the members of the ICT steering committee. Working committee is another example of duopoly archetype where the head and some senior staff of ICT join together with senior staff of Treasury division to form a working committee for devolving of the financial management system project. These duopoly committees allow ICT to convey their concerns and initiatives to other divisions in the Ministry and vice versa as well. By carrying out frequent meetings, the linkage between ICT and other divisions in the organisation will be improved and have common understandings of the roles and importance of ICT to the operation of the organisation.

In view of the similarities in structure mechanisms, it demonstrates that the Ministry is on the right track by adopting some of the practical structures found in other organisations to improve the implementation of ICTG. In addition, more structure mechanisms are found in the research such as the proposed internal audit committee, structure for the ICT budget, roles and responsibilities of ICT and related ICT decision makers are defined, and strategy plans are also defined. Therefore, it is emerged that good ICTG structure mechanisms should be focused on the following elements: organisation structure, roles and responsibilities, strategy plans, budget, audit committee, and decision making committees.

The organisation structure element should identify the decision makers in ICT through the architecture of its structure. The organisation structure should also demonstrate the reporting structure in ICT and its leader. Moreover, the organisation structure should provide carrier paths and better working culture and environment for the employees. The organisation structure also shows capacity of human resources in the organisation in terms of number of employees, knowledge, and skills.

The roles and responsibilities describe the tasks assigned for each employee in the organisation. The end result of each task should be linked with

the ICT objectives and these objectives should also be linked with the objectives of the organisation. This will ensure that each task perform by ICT contributes to achieving the objectives of the organisation.

The strategy plans element draws the road map for the organisation to follow. The strategy plans outline the goals and objectives of the organisation, the objectives of ICT, and how those objectives are linked with the objectives of the organisation. Thus, the strategy plan or corporate plan of the organisation should be in placed so that ICT strategy plan can be derived from the corporate plan.

The budget element provides financial plan and capacity for ICT to ensure that ICT has sufficient financial resources to perform its services. This is vital for the success of any ICT project in the organisation.

The audit committee element refers to a group of independent people who can double check the actions taken by ICT and the performances of their services. The audit committee can be formed internally or from an external organisation with audit function. The audit committee should focus on whether ICT have in placed adequate controls on the systems used in the organisation and also verify whether ICT comply with the policies of the organisation. Moreover, the audit committee should ensure that the investment of the organisation in ICT gain benefits from it. The performance of ICT services should also be checked against the expectation and satisfaction level of the organisation. If the organisation does not satisfy with the services provided by ICT then there is serious gap between ICT and the organisation which is required to be addressed and attended immediately. The decision making committee refers to a group of people who make decision on ICT initiatives in the organisation. Such committee like the HOD committee and ICT steering committee identified in the research. By having the opinion of the audit committee it promotes transparency and accountability within the structure of ICTG. As a result, ICT will perform responsibly and prudently in their services and initiatives and ensuring that more productive outcomes will be yielded by the organisation.

However, designing effective ICTG should consider acquiring adequate and well-balanced structure mechanisms in the following structure elements: strategy plan, organisation structure, budget, roles and responsibilities, decision making committee, and audit committee as per summarised in figure 5.1.
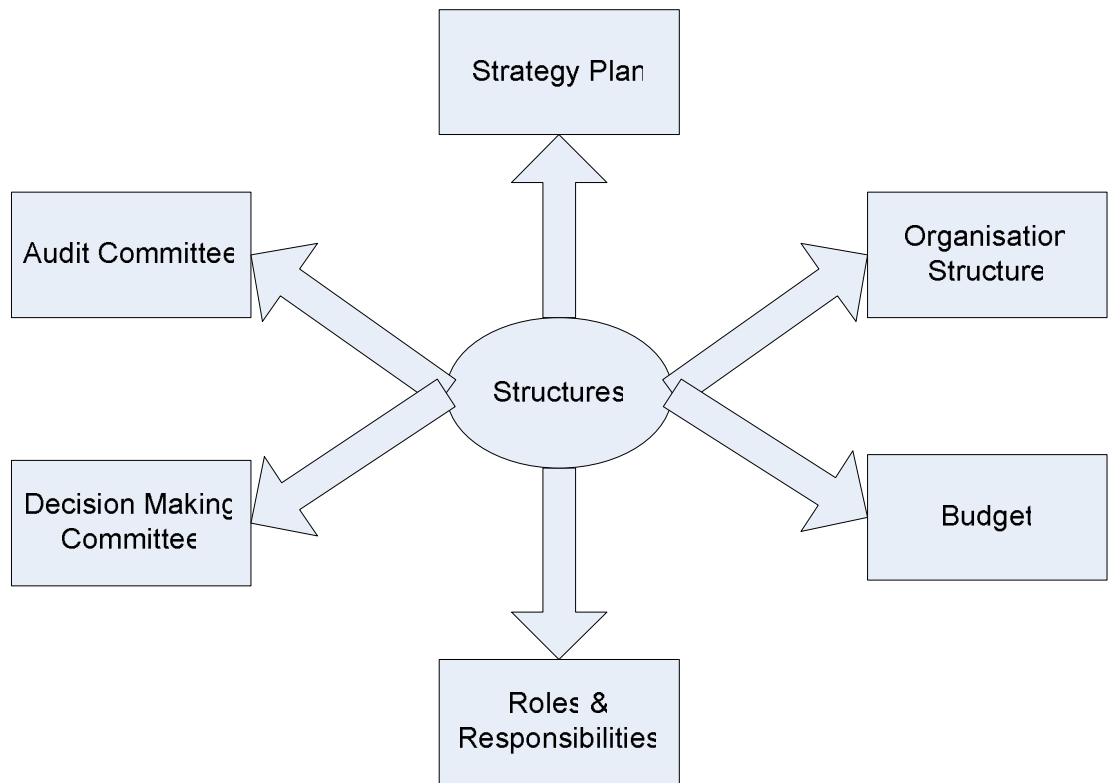
Figure 5. 1: ICTG Structures Mechanisms Focus Elements
(Source: Author, 2009)

Second is the discussion on the similarities in ICTG processes. The research finds that the process of getting approval for ICT investment project found in chapter 2 is similar in some ways to the approval process for an ICT project in the Ministry. An ICT investment project has to go through an investment committee to assess the return of investment for the organisation on that project before approval while an ICT project in the Ministry will have to be submitted to ICT to assess the cost and benefit analysis before submitting ICT project to necessary authorities for approval. Chapter 2 provides other process mechanisms that are important for the success of ICTG implementation such as project tracking, using of CMM, and balance scorecard. On the other hand, the research finds other process mechanisms as well such as the process for obtaining funding, procurement, and ICT support services.

In view of the similarities in processes mechanisms outlined in chapter 2 and chapter 4 above, the success of ICTG implementation will depend on having adequate processes mechanisms in the following focus process elements: project approval, project management, project funding, and performance measurement. The project approval element should identify people to discuss the project with

and people to approve the project. These people can be the same for both the discussion and approval. By knowing and understanding the nature and expectation of these people will make it easier for ICT to approach them and communicate with them on ICT initiatives. The key here is to make sure that ICT projects are aligned with the objectives of the organisation. A close relationship should be maintained with these key people for they are vital for the effectiveness of ICTG. These people should be approached and updated frequently and whether formally or informally on the status of any ICT project. By doing so, ICT will gain the trust of these people on ICT initiatives and as a result, these key people will support and approve ICT projects that will benefit the organisation.

The project management element should identify the processes involved in an ICT project starting from the initiation of the project up to implementation and maintenance of the project. Such processes like the ones presented by De Haes and Van Grembergen (2005) whereby the ICT project progresses through project initiation, idea validation, projects prioritisation, seek funding and approval, project development, and project maintenance. The project tracking and formal tracking by Weill and Ross are considered as part of the project management process to monitor the project and to ensure that the project is within schedule and also align with the objectives of the organisation. Time is a very important factor and it should be managed prudently to ensure that the project is delivered according to schedule otherwise the possibility of over running the project budget and loosing the business interest and benefits from the project will occur.

The project funding element should identify the source of funding for the project or where to get funding. Such processes like the one identified in the research as described in chapter 4 under "Funding request process" in section 4.4.2.1. Funding can be obtained internally from the organisation current financial budget or seek funding from external donors if the internal funding is insufficient. This process should be carried out during the initiation phase of the project to ensure that adequate funding is available to facilitate the project.

The performance measurement element should include tools to measure the performance of ICT projects to ensure that ICT projects meet with the objectives of the organisation. Such tools like the balance scorecard found in the study by De Haes and Van Grembergen (2005). The performance measurement process mechanism also shows the benefits from the ICT projects such as

reducing operational cost and improving work efficiency. Hence, any project in ICT should consider and ensure that appropriate processes mechanisms are in placed for approval, management, funding, and performance measurement as shown in figure 5.2.
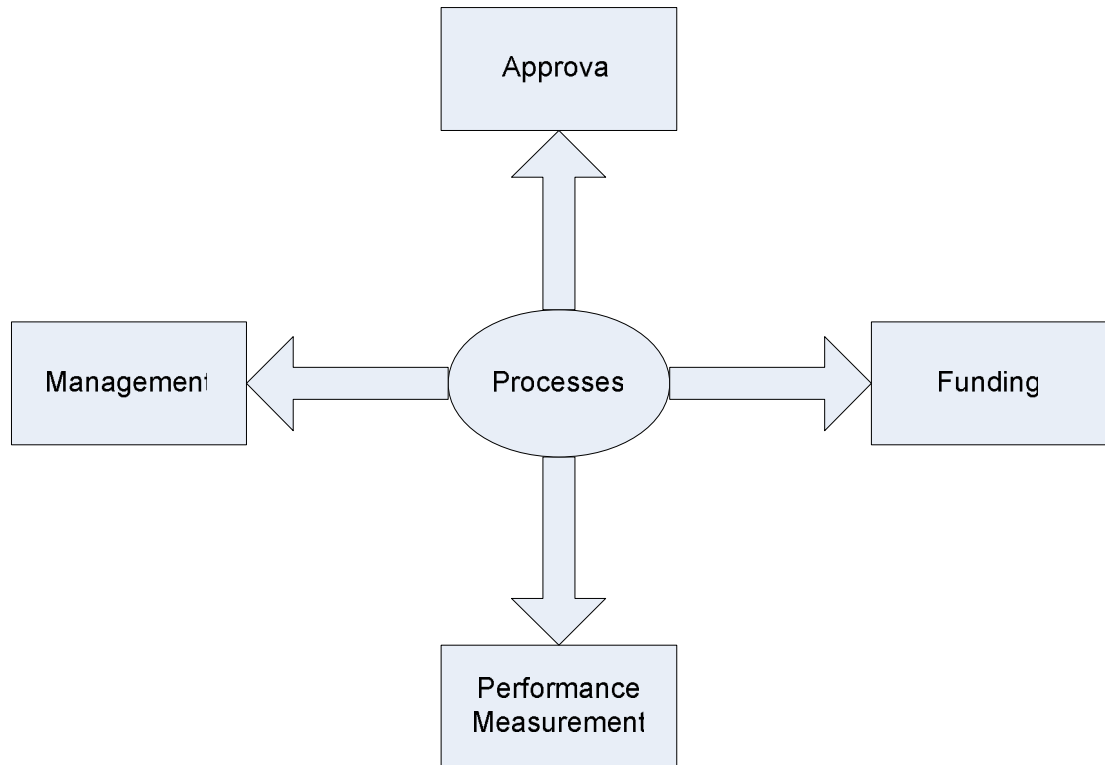
Figure 5. 2: ICTG Processes Mechanisms Focus Elements

(Source: Author, 2009)

Last is the discussion on the similarities in ICTG communications. The research finds that there are some similarities in the communications mechanisms identified in chapter 2 and the ones identified in chapter 4. The senior management announcement presented by Weill and Ross (2004) is similar to the Director weekly meeting described in chapter 4. The senior management announcement attracts the attention of the organisation and commits the initiatives from ICT whereas the Director weekly meeting is where the Director conveys to all staff in the Ministry on the important issues within the Ministry including ICT initiatives. As per described in chapter 4, staff can raise their concerns within this meeting. The formal meeting presented by Weill and Ross (2004) and De Haes and Van Grembergen (2005) is also similar to the HOD committee and ICT steering committee found in the research. The formal meeting is used to carry out the decision makings on ICT projects which is similar to the function of HOD

committee and ICT steering committee. The HOD committee is responsible for making decision on large ICT projects while ICT steering committee is responsible for recommending and reporting ICT projects and initiatives to HOD committee. The concept of training presented by Weill and Ross (2004) and De Haes and Van Grembergen (2005) is similar to the training mechanisms found in the research. The concept is to educate employees in the organisation about ICT and update staff on policies, procedures, and progress in ICT initiatives. Weill and Ross (2004) present training through web-based portals and De Haes and Van Grembergen (2005) present educating staff through internal magazines whereas training found in the research is through the traditional way of teaching whereby training is conducted in a training room with all trainees sitting down and listen to the trainer. Another method of training found in the research is through one-on-one basis whereby ICT trainer is alongside by the trainee and showing him how the particular system or application works. The research also provides more mechanisms for communication such as the divisional meeting, email and telephone, and help desk. Email, telephone, and help desk are found to be the most commented mechanisms by the interviewees in the Ministry as shown in table 5.3.

Communications Mechanisms	Number of Interviewees commented
Director Weekly meeting	2
Divisional meeting	5
Email and telephone	8
Help Desk	7
HOD meeting	2
Training	4
Working committee	1

Table 5. 3: Communications Mechanisms Table

(Source: Author, 2009)

There were eight interviewees who commented on the use of email and telephone as mechanisms for communication while seven interviewees commented on the help desk as a mechanism for communication. Email, telephone, and help desk are found to be the most efficient and preferable way of communication by staff in the Ministry. Help desk is also found to be utilising both email and telephone as its main form of communication. Help desk as described in chapter 4 is the most effective way of getting support on staff's ICT issues from ICT.

In view of the similarities and communications mechanisms outlined in chapter 2 and chapter 4 above, the success of ICTG implementation will depend on having appropriate communication mechanisms within the following focus communication mechanisms elements: meeting, training, and communication tools.

The meeting element refers to any form of meeting including formal or informal meeting where ICT get together with end-users and discuss ICT issues. The formal meeting can be conducted through formal committees such as the ICT steering committee, working committee, divisional committee, and HOD committee identified in the research. On the other hand, the informal meeting can be conducted through one-one-one basis where the head of ICT drops by in the executive management member's room or join together through a cup of coffee or lunch and discuss ICT issues.

The training element refers to the way ICT educate its end-users on how to use ICT and providing awareness on ICT. Training also includes the means for conducting the training such as through web-based portals and internal magazines. Training can also be conducted through one-on-one basis or a group. The communication tools element refers to technologies or ways that can be utilised to carry out the communication between ICT and its end-users such as email and telephone. As mentioned above, the research finds that email, telephone, and help desk are the most effective and recommended means of communication for the communication between end-users and ICT due to its convenient and efficiency. These focus elements of communication mechanisms can be demonstrated in figure 5.3.
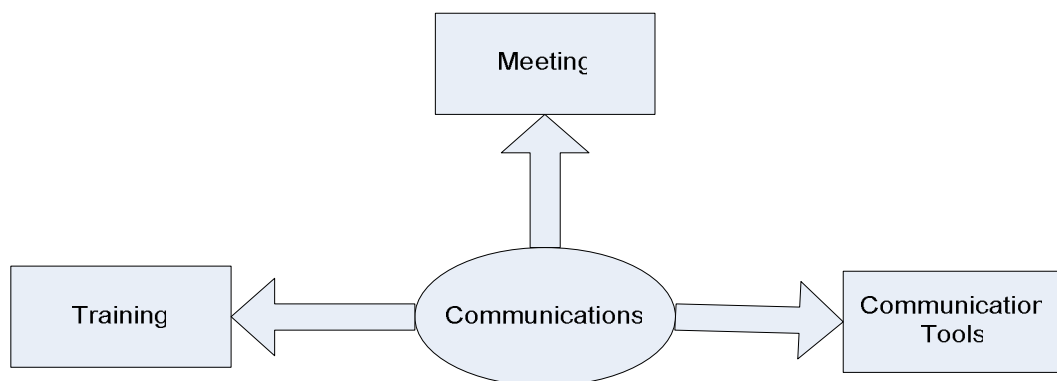
Figure 5. 3: ICTG Communication Focus Elements
(Source: Author, 2009)

5.4 Factors influencing ICTG implementation

In chapter 2, it is noted that there are various factors found in ICTG implementation from previous studies. These factors are reported in two categories: enabler factors and inhibitor factors. The enabler factors are the ones that drive and encourage the improvement in ICTG implementation. Such enabler factors like senior executive support for ICT reported by Luftman et al. (1999) and adequate financial support and human resources are available reported by Gottschalk (1999, cited in Lee et al., 2008). In contrast, the inhibitor factors are the ones that hamper the improvement in ICTG implementation. Such inhibitor factors like ICT/business lack close relationship presented by Luftman et al. (1999) and poor leadership presented by Gichoya (2005).

By exploiting the structure used in chapter 2 for reporting the factors influencing ICTG implementation, the factors found in the research as described in chapter 4 can be categorised into enablers and inhibitors. Each factor is categorised in accordance to its associated ICTG focus area. The classification of these factors is determined by the likely output of the impact of that factor. For example, if a particular factor will improve the effectiveness of the ICTG implementation then it will be classified under enabler factors category; otherwise, it will be classified under inhibitor factors category. The classification of similar factors found in chapter 2 also helps in classifying these factors. This is demonstrated in table 5.4.

ICTG Focus Areas	Enabler Factors	Inhibitor Factors
Structures	- Aligning ICT Plan with Corporate Plan - ICT to be more strategic - Respecting each other - Awareness on the importance of ICT - Awareness on the importance of ICTG - ICT governance should be addressed in SDP - ICT to be more coordinated	- Inadequate ICT structure - Lack of leadership - Lack of staff - Lack of understanding on ICT management - Seniority in the organisation structure - Conflict of interest for ICT - Dependency on the Chairperson - Hierarchy in organisation structure - ICT responsibilities are not defined clearly

Processes		- Gender - Wide scope of ICT services - Human Error - ICT Outsourcing - Lack of commitment from executive management - Lack of commitment from ICT - Lack of Documentation and Instruction - Lack of funding - Outdated information - Wide distribution of processes
Communications	- Collaboration between ICT and end-users - Trust in ICT services - User satisfaction on ICT service - Executive management supports ICT	- Misunderstanding between ICT and end-users - Wrong perspectives on the roles of ICT - End-users' lack of ICT knowledge - ICT is mostly reactive - Lack of change management - Lack of Communication - Lack of ICT Training for end-users - Lack of training for ICT staff - Lack of updates from ICT to executive management on ICT projects

Table 5. 4: Enabler and Inhibitor Factors Summary
(Source: Author, 2009)

Table 5.4 shows that there are similarities between factors found in chapter 2 and the factors found in the research. This might mean that these factors are common in most organisations. For example, one of the enabler factors in table 5.4 is the aligning ICT plan with corporate plan which is similar to the enabler factor found in the study by Luftman et al. (1999) which is the business – ICT partnership. These two factors emphasize the need for ICT and business to be integrated to enhance the governance of ICT. The research also finds the enabler factor – ICT to be more coordinated which is similar to the enabler factor found in the study by Gichoya (2005) – coordination and change management. These two factors highlight the importance for ICT to be more coordinated in managing and organising its personnel and services in supporting the needs of the organisation. Furthermore, the study by Luftman et al. (1999) and the research both agree that senior executive or executive management supports ICT. This shows that it is

vital for the success of ICTG implementation to gain the support of senior executives.

On the other hand, there are also similarities in inhibitor factors found in chapter 2 and the ones listed in table 5.4 from the research. For example, both the research and the study by Luftman et al. (1999) agree on ICT management being lack of leadership as an inhibitor factor. Furthermore, both the research and study by Gichoya (2005) agree on lack of financial support as inhibitor factor. Another inhibitor factor reported by Lee et al. (2008) is the inadequate stakeholders' involvement which is similar to the one found in the research which is lack of commitment from executive management. Lack of communication between ICT and end-users is also another inhibitor factor to be found in both the research and the study by Lee et al. (2008).

Apparently, some of the common factors identified above are also the most commented factors by the interviewees in the research as it is shown in table 4.3. These most commented factors are: aligning ICT plan with corporate plan from enabler factors, and lack of funding, lack of commitment from executive management, and lack of communication between ICT and end-users from inhibitor factors. This emphasizes that these factors should be top priority in the agenda of ICT and executive management to improve the effectiveness of ICTG implementation in the organisation. In addition to these factors are the other factors identified in table 4.3 such as inadequate ICT structure, lack of staff, lack of document and instruction, outdated information, ICT is mostly reactive, and wrong perspectives on the roles of ICT.

5.5 Causes of factors influencing ICTG implementation

The main causes of the identified factors listed in table 5.4 might be due to the inadequate mechanisms used in the following ICTG focus areas: structures, processes, and communications. For example, the research finds that inadequacy of the ICT organisation structure causes the following inhibitor factors: lack of leadership role from ICT, lack of staff as the structure does not provide a better carrier path for ICT staff, and conflict of interest between the function of ICT and human resource division. The inadequacy of roles and responsibilities will also cause the following factors: uncoordinated ICT organisation, unclear responsibilities for ICT staff, and conflict of interest. On the other hand, by

having adequate structure mechanisms such as a well developed ICT strategy plan which linked to corporate plan, the alignment between ICT plan and corporate plan will be increased resulting in effective ICTG. By establishing the steering committee will improve the awareness of executive management on the importance of ICT and ICTG as well. ICT will be more proactive and take lead strategically if the head of ICT becomes a full member of the HOD committee. A better ICT organisation structure will also allow ICT to take part in the HOD committee and act proactively through the HOD committee and ICT steering committee.

In addition, the inadequacy in process mechanisms causes inhibitor factors in ICTG implementation. For example, inadequate ICT support services process will increase the lack of commitment from ICT and also reduce the satisfaction level of end-users on ICT services. The misunderstanding between ICT and end-users will continue to deteriorate as well. The inadequate ICT project proposal approval process will increase the lack of commitment from executive management on ICT projects. This will also indicate the lack of documentation and instruction in placed in ICT. The inadequate donor request process will not help obtaining funding for ICT projects. By having inadequate budget preparation process will not help obtaining funding and support from executive management on ICT initiatives as well. On the contrary, by having appropriate process mechanisms on ICT project proposal approval process will increase the support from executive management. By having adequate ICT support services process will also improve the level of end-users' satisfaction on ICT services and improve the commitment from ICT as well. The adequate ICT budget preparation process and adequate donor request process will increase the chance of having adequate funding for ICT initiatives.

Furthermore, the inadequacy in communication mechanisms causes inhibitor factors in ICTG implementation. For example, inadequate help desk mechanism reduces the satisfaction level of users on ICT support services as well loosing the trust of users on ICT services. The inadequate training mechanisms or lack of training will increase the misunderstanding between ICT and end-users. The lack of end-users ICT knowledge will also be increased and end-users will still have negative perspectives on ICT as well. Moreover, the lack of meetings whether it is HOD meeting or working meeting will reduce the support of the

executive management on ICT initiatives and also hinder collaboration between ICT and end-users. On the positive side by having adequate communication mechanisms such as using email, telephone, training, and meeting appropriately, issue are mitigated.

Therefore, by having inadequate mechanisms in placed for the three ICTG focus areas: structure, process, and communication will generate inhibitor factors whereas in placing adequate mechanisms on them will definitely promote enabler factors. There is no use of trying to encourage enabler factors and minimise inhibitor factors if their causes are not identified. The main causes lie within the structure, process, and communication mechanisms, it is therefore imperative to first fix the root of the causes in order to improve inhibitor factors and generate enabler factors to yield a successful and effective ICTG implementation in the organisation.

5.6 The relationship between factors and ICTG

In view of the factors listed in table 5.4 and the discussion above in section 5.5, it is noted that there is relationship between factors influencing ICTG implementation and ICTG. The discussions show that by encouraging the enabler factors, it will result in a more improved and effective ICTG, otherwise, ICT will never exploit its full capacity to benefit the organisation. In other words, the organisation will never realise the full potential of ICT and utilise ICT for its competitive advantage. For example, when the alignment between ICT plan and corporate plan is improved, ICT support the organisation better by delivering the expectation of the organisation. According to Broadbent and Kitzis (2005), synchronising ICT strategy with business strategy is an indication of good ICTG.

On the contrary, if the enabler factors are not encouraged and fostered in the organisation then the implementation of ICTG will likely to fail and ineffective. Moreover, by encouraging the inhibitor factors in the organisation will also result on ineffective ICTG implementation. This is demonstrated in figure 5.4.
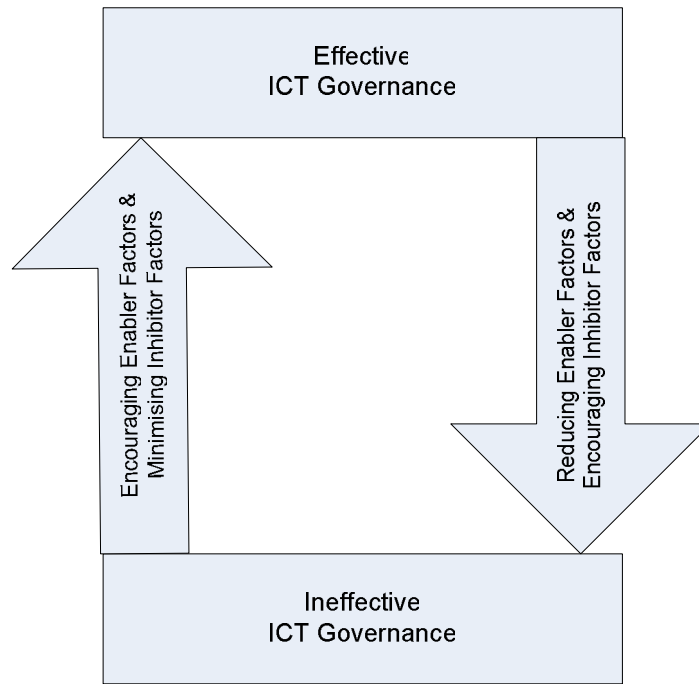
Figure 5. 4: ICTG and Factors Relationship

(Source: Author, 2009)

Therefore, it is suggested to encourage the enabler factors at the same time while major improvement is required for the inhibitor factors to guarantee a successful and effective ICTG implementation in the organisation.

5.7 Recommended practices for ICTG implementation

The preceding discussions on the similarities between the chapter 2 and chapter 4 and the ideas that emerge from the findings complete the comparisons. In this section some of the best practices are discussed that the organisation can adopt where appropriate and applicable in the implementation of ICTG to improve the effectiveness of ICTG.

With regards to ICTG structure, ICT is to be addressed in the strategic level of the organisation where executive management are involved to improve the alignment between ICT strategies and the organisation strategies. The understanding of executive management will be improved as ICT tends to be more business oriented. ICT projects will be business driven instead of technology driven. This means that ICT projects will only implement if it supports a business strategy instead of just aligning with the trend of technologies. To do this, the head of ICT should participate as a member of the executive

management committee such as the HOD committee. This will enable the head of ICT to raise their concerns at the strategic level or decision making level.

The ICT organisation structure should be designed as mentioned in section 5.3 to define the reporting structure and carrier path for ICT employees. The structure of ICT should also reflect their functions in the organisation. However, ICT perform better in supporting the organisation when they are structured as a separate unit within the overall organisation structure. In doing so, ICT will take lead in achieving the strategies of the organisation without disruption from any other business unit within the organisation like how ICT is currently structured in the case organisation. By having a separate ICT division will foster a better working environment for ICT staff and also retain ICT staff as they can see a better carrier path within the structure.

ICT budget should also be identified as mentioned in section 5.3 to ensure that ICT has adequate financial support for its operations and projects.

A strategy plan as mentioned in section 5.3 should be in placed for ICT to show the directions and actions that ICT should perform to achieve the strategies of the organisation. ICT strategy plan should be derived from the strategy plan of the organisation to ensure that ICT meets the expectation of the organisation and as a result, the organisation get better returns on its ICT investments as well.

The decision making committees as mentioned in section 5.3 should be established where necessary to improve the control over ICT initiatives. Such committee like the executive management committee and ICT steering committee. The members of the executive management committee should come from the head of each division within the organisation. It is recommended that the head of ICT should take part in this committee as a full time member. On the other hand, the members of ICT steering committee must include the head of ICT and head of all or some of the other divisions within the organisation. The active participation of both ICT and other divisions' executive members in these committees will increase their collaboration and common understanding on ICT matters. The roles and functions of each committee should also be clearly defined.

An audit committee as mentioned in section 5.3 should also be adopted to ensure that ICT comply with organisation policies and have adequate controls in placed on ICT systems. Having an audit committee will cultivate transparency and accountability within ICT.

The role and responsibilities as mentioned in section 5.3 of ICT including its staff is to be clearly defined and spelled out to ensure that ICT can be performance audited. The scope of the function of ICT should also be defined to avoid any misunderstanding regarding the services provided by ICT.

ICT is to be a separate entity in the organisation structure depending on the size and function of that organisation. For small organisations with 10 or less employees, ICT will not necessary be a separate entity as one person can perform multiple tasks. For example, this person can be the manager doing administration, finance, and ICT activities. Whilst in medium to large organisations like the Ministry, the functions of the organisation are more defined. It is therefore important that ICT is recognised as a separate unit within the organisation to enable ICT to effectively support the functions of the organisation and provide better services. Better carrier path and working environment will be generated which enable ICT to sustain its employees. In this way, ICT will also be recognised equally with other divisions in the organisation and report directly to the executive management committee. The head of ICT will also participate as full member of the executive management committee.

With regards to ICTG process, appropriate process mechanisms are to be placed within the four main process mechanisms elements identified in section 5.3: funding, approval, management, and performance measurement. In addition to these process mechanism elements, practical ICTG frameworks such as COBIT, Val IT, ITIL, and COBIT CMM should be adopted by the organisation to ensure that the organisation is implementing effective and proven process mechanisms in ICTG. Adopting of such framework will make it easier and faster for the organisation to implement ICTG instead of starting from scratch even though such framework will not satisfy all the expectation of the organisation. The COBIT CMM should be used to assess the maturity level of ICTG in the organisation before implementing ICTG. Once the level of ICTG maturity is identified, the COBIT framework can be adopted to design ICTG structure and implementation framework that are suitable for the organisation and making sure that ICT strategies meet with organisation strategies. The ITIL framework should be adopted to manage the services of ICT to ensure a more productive and satisfaction outcome. The ITIL framework can also be adopted to manage the implementation of ICTG as a project starting from its initiation phase up to its

implementation and maintenance phases. The Val IT framework should also be adopted to monitor the investment of the organisation in ICT to ensure that valuable returns are obtained.

Moreover, the 'COBIT Quickstart' software program as mentioned in chapter 2 can be utilised to speed up the processes in the implementation of ICTG.

The ICTG implementation should be treated as a project by going through the project phases which consists of ICTG requirement analysis including identifying the goals of the organisation and ICT, designing a solution for improvement, developing the solution, implementing the solution, and maintaining that solution.

Such agreement like the service level agreement (SLA) is to be in place when outsourcing ICT services to external vendors to make sure that both parties agree on the terms of services that the vendors should provide. The agreement should define the scope of the roles and services that the vendors should provide to the organisation and at the end, the expectations of the organisation should be met by the vendors. By exploiting such agreement, it will reduce the challenges between the organisation and its outsourcing vendors. The services provided by vendors will conform to the agreement with the organisation.

Some process mechanisms involve too many channels whereby it requires to be reduced to minimise any obstruction that may arise and speed up the process. However, the processes that are in placed at the case organisation are reasonable like the ICT project proposal approval process and ICT procurement process. These processes show that the case organisation considers the balance between speed and control are in placed within these process mechanisms.

The processes carried out in ICT such as troubleshooting and backup and restore processes should be documented. Documentation of critical processes in ICT is vital for the continuation of the operation of ICT. This is part of knowledge management as well to ensure that knowledge is not lost when ICT employees are leaving the organisation. The documentation will also assist new employees in ICT as part of his learning at work and how to improve from there instead of starting from the beginning again. In addition, ICT policies are also to be documented such as computer usage policy, network security policy, and email policy. Documentation reduces the inhibitor factors by redressing the lack of documentation and instructions.

All documents and manuals in ICT should be updated frequently when necessary to ensure they go along with the current situation of ICT whether it is about strategy plans, policies, operational procedures, server manuals, or network manuals. By keeping these documents updated, ICT will be confident about the continuation of its operation in the event of disaster or unexpected failure.

With regards to ICTG communication, appropriate communication mechanisms should be in placed for the three main communication mechanisms elements identified above: formal committee, training, and communication tools. Again, it is important to highlight that help desk is an effective communication mechanism found in the research for end-users to get support from ICT. As it has been described in chapter 4 - section 4.4.3.1, help desk mechanism utilises both email and telephone for its communication and this mechanism will be more effective when it is used and managed properly. Training is a great communication mechanism which helps improving the ICT knowledge of end-users as well as reducing the lack of communication inhibitor factor found in the research.

In addition to these communication mechanisms, the research finds that it is vital for ICT to collaborate with end-users like when initiating or implementing ICT projects. This collaboration can be done through trainings and informal meetings. End-users are part of the performance indicators of ICT and key to the success of ICT services and products in placed in the organisation. So, when the satisfaction level of end-users with ICT services and products increases, it also increases the performance of ICT. By working closely with end-users, ICT will understand and know better the expectation of the end-users so that ICT can deliver better services and products that meet the expectation of end-users as well as the organisation. As a result, the full capacity of ICT will be more utilised and its benefits to the organisation will also be increasingly realised. The collaboration between ICT and end-users will also reduce the lack of communication between ICT and end-users inhibitor factor found in the research. Misunderstanding between ICT and end-users factor will also be reduced.

Approaching the executive management members informally through informal meeting or cup of coffee is also a good method to close the gap between ICT and executive management on ICT matters. By doing so, it will improve the understanding of executive management on ICT initiatives and it will also gain

the support of executive management on ICT initiatives. Instead of waiting for the executive management meeting, ICT should be proactive and take the ICT matters into executive management members individually and discuss with them before and after presenting it in the executive management meeting. In doing so, it will change the perspective of executive management on the approach of ICT from reactive to proactive.

A working committee could be utilised where and when necessary to drive and ICT project and enable ICT and other divisions in the organisation to work together in designing and implementing an ICT project. This will also increase collaboration between ICT and other divisions in the organisation. Hence, reducing the potential for misunderstanding on ICT services and products matters.

Lastly, a change management plan should be in placed including trainings and meetings with end-users to ensure that end-users are aware of the changes on ICT services or products. The change management should be monitored appropriately to ensure successful implementation of ICT services or products.

5.8 Conclusion

The ICTG frameworks, mechanisms, and factors found in the findings in chapter 2 and chapter 4 have been compared, and discussed. As a result, this chapter shows that it is important for an organisation to adopt well-known international ICTG frameworks such as COBIT to assist with implementation of ICTG as it reduces the need to start from the beginning. It also speeds up the implementation process, and provides support and access to experienced ICTG experts. This chapter also identifies that it is not necessary an organisation adopts everything in the chosen well-known international ICTG frameworks. Only the parts that are applicable to the organisation are necessary to apply.

The discussion shows that mechanisms for ICTG structure are to consider the following elements to be more effective: strategy plan, organisation structure, budget, roles and responsibilities, decision making committee, and audit committee. The following elements are also required to be considered when designing ICTG processes mechanisms. These processes mechanisms elements are management, approval, funding, and performance measurement. To decide on mechanisms for ICTG communication the following mechanisms elements are required: training, meetings, and communication tools.

The factors influencing ICTG implementation are classified into two categories: enablers and inhibitors. By classifying factors into these two categories the relationships and causes of factors can be identified efficiently.

The main causes of the reported factors are due to the inadequacy of mechanisms used for implementing ICTG. When appropriate mechanisms are selected and used appropriately, the result is effective ICTG. The relationship between the identified factors and ICTG shows that by encouraging enabler factors and reducing the impact of inhibitor factors leads to effective ICTG implementation, otherwise, ineffective ICTG implementation will be the result.

The chapter concludes with some of the recommended practices developed from both the literature in chapter 2 and findings from the research in chapter 4 as guidance for organisations to adopt where and when applicable.

Chapter 6
Conclusion and Recommendations

6.1 Introduction

In Chapter 1, the research states that ICTG is the potential driver of the economy growth of the 21st century and it becomes top in the agenda of most developed countries such as Australia and America. The purpose of ICTG is to ensure that ICT is supporting the strategies and objectives of the organisation. The literature identifies that there are lack of research in ICTG especially in the factors influencing ICTG implementation. It is also the motivation of the research to conduct a research in ICTG in the South Pacific islands for there is lack of research in ICTG to be found from the developing countries.

In Chapter 2, the literature identifies that ICTG is an integral part of the corporate governance and there are various frameworks for implementing ICTG such as COBIT and Val IT. The literature also identifies that some guidelines for implementing ICTG in the organisation and a framework for ICTG implementation. The framework states that ICTG can be implemented through a mixture of structures, processes, and communications mechanisms. Furthermore, the literature identifies some challenges in the relationship between ICT and business with regards to the implementation of management practices, the effects of implementation and the governance of these processes. However, the purpose of the research is to find out the factors influencing ICTG implementation in order to develop best practices to assist with organisations in implementing effective ICTG.

To carry out the research, a qualitative approach is chosen in Chapter 3 to conduct an exploratory research through a single case study in the Ministry in Tonga. The methods used to collect primary and secondary data in the research are unstructured interviews, documents collection, and diary recordings. The collected data are analysed using thematic analysis method with the aid of NVivo software. The data analysis involves coding, categorising, and sorting with the aim to identify factors that influence ICTG implementation in the organisation within ICTG implementation framework identified in the literature in Chapter 2.

In Chapter 4, the findings of the research is described and presented in accordance with the framework identified in Chapter 2. Various mechanisms and factors were found and described under each focus area of the framework.

The findings from Chapter 4 were discussed in Chapter 5 whereby some valuable ideas have been discovered to assist organisations with the implementation of ICTG as well as contributions to the ICTG body of knowledge.

Chapter 6 will identify the learning of the research from Chapter 5 in response to the research questions raised in Chapter 3 and also summarise the recommended practices as guidance for practitioners while implementing ICTG in organisations. This chapter further identifies some limitations of the research and provide recommendations for further research in the future.

Chapter 6 is structured so that learning of the research is described in section 6.2 and recommendations for practitioners are summarised in section 6.3. In section 6.4, limitations of the research are described follows by the recommendations for further research described in section 6.5. A conclusion is then drawn in section 6.6.

6.2 Learning from the Research

From the literature reviewed in Chapter 2, it shows that having the ICTG framework ready is not sufficient to equip organisations for implementing effective ICTG. The most challenging step is actually deploying the ICTG framework in the implementation of ICTG which requires guidance to assist with the deployment. Thus, the research provides frameworks for developing ICTG mechanisms and best practices that will help organisations with the implementation of ICTG.

The overall learning of the research will come down to the answers for the research questions identified in Chapter 3. The research identifies three main focus areas as framework for the implementation of ICTG which are the structures, processes, and communications. However, in order to implement effective ICTG, appropriate mechanisms should be in placed within the ICTG implementation framework. In fact, the main focus of ICTG is to ensure that ICT is supporting the strategies and objectives of the organisation. To achieve this, ICTG is required to identify the decisions to be made, the purposes of those

decisions, who are responsible for making those decisions, and how those decisions have been made.

In response to the research question of how the organisation implements ICTG, the research finds that there are various mechanisms that have been implemented by the case organisation within the ICTG implementation framework such as the HOD committee, ICT project approval process, and training. Based on the comparison of the literature and the findings of the research, there are common core elements of the mechanisms used in the implementation of ICTG in the organisation. Hence, the author develops three frameworks as guidance for developing mechanisms for implementing ICTG. The first framework shows that in order to have effective ICTG structures, appropriate mechanisms should be in placed in the following six elements: strategy plan, organisation structure, budget, roles and responsibilities, audit committee, and decision making committee. The second framework shows that in order to have effective ICTG processes, appropriate mechanisms should be in placed in the following four elements: approval, funding, management, and performance measurement. The third framework shows that in order to have effective ICTG communications, appropriate mechanisms should be in placed in the following three elements: training, meeting, and communication tools. However, by having appropriate mechanisms in placed within these three ICTG mechanisms frameworks helps improving the implementation of ICTG to be more effective.

Next, in response to the research question of what factors that influence ICTG implementation, the research finds that factors arise from the various dimensions of the organisation such as management, technical, and social. In comparison of the literature against the research finding, the factors found from the research can be classified into two main categories: enablers and inhibitors. From the literature, the enabler factors drive the implementation of ICTG to be more effective while the inhibitor factors hinder the implementation of ICTG in the organisation. By knowing the possible impact of the two categories on the implementation of ICTG, better best practices for ICTG implementation can be developed.

Furthermore, the research finds that the most commented factors in structure mechanisms as identified in table 4.3 are the: inadequate ICT structure,

lack of staff, awareness on the importance of ICT, aligning ICT plan with corporate plan, awareness of the importance of ICTG, and seniority in the organisation structure. On the other hand, lack of funding, lack of documentation and instruction, lack of commitment from ICT, wide scope of ICT services, lack of commitment from executive management, and outdated information are the most commented factors in process mechanisms. Moreover, the most commented factors in communication mechanisms are: ICT is mostly reactive, user satisfaction on ICT services, lack of communication between ICT and end-users, wrong perspectives on the roles of ICT, and lack of ICT training for end-users. It is noted that most of these factors belongs to the inhibitor category. The most commented factors indicate that these might be the most influencing factors in ICTG implementation. Therefore, it is imperative for both ICT and executive management to draw attention into these most commented factors and review its impact on the implementation of ICTG. The author suggests trying to mitigate the inhibitor factors while encouraging the enabler factors to yield effective ICTG.

In response to the research question of what causes the factors influencing ICTG implementation, the author argues that the main cause of inhibitor and enabler factors are from the inadequacy of the mechanisms in placed within the three ICTG focus areas. Hence, it is important that the causes of the factors should be fixed in order to gain effective ICTG implementation.

Lastly, in response to the research question of what the relationship between the factors influencing ICTG implementation and ICTG is, the author claims that the relationship between factors and ICTG lies within the impact that these factors have on ICTG. The research finds that the impact of inhibitor factors and enabler factors will result on either ineffective ICTG or effective ICTG respectively. Thus, the author predicts that by encouraging enabler factors while minimising inhibitor factors will result on effective ICTG. On the contrary, by reducing enabler factors while encouraging inhibitor factors will result on ineffective ICTG. Therefore, organisations should focus on the positive effect of the relationship by encouraging enabler factors while minimising inhibitor factors to achieve effective ICTG.

6.3 Recommended Practices for ICTG Implementation

Based on factors influencing ICTG implementation, its causes and effect on ICTG found in the research, these factors become as benchmark for developing best practices. A summary of the developed best practices identified in the research is listed in table 6.1 as guidance for practitioners in the implementation of ICTG in organisations to improve the effectiveness of ICTG. Each of the recommended practices below either reduces the impact of inhibitor factors or encourages the impact of enabler factors in the implementation of ICTG to be more effective.

ICTG Focus Areas	Recommended Practices
Structures	- ICT should be addressed in the strategic level. - Appropriate ICT organisation structure should be in placed. - ICT should be a separate entity in the organisation structure. - Appropriate mechanisms for determining ICT budget should be in placed. - ICT strategy plan should be in placed. - The decision making committees should be in placed such as ICT steering committee. - An audit committee should be in placed. - The role and responsibilities of ICT should be clearly defined.
Processes	- Process mechanisms for seeking and obtaining funding should be in placed. - Process mechanisms for approval of ICT initiatives should be in placed. - Process mechanisms for ICT project management should be in placed. - Appropriate tools should be in placed to measure performance of ICT projects like balance scorecard. - Practical ICTG frameworks such as COBIT, Val IT, ITIL, and COBIT CMM should be adopted. - Adopt 'COBIT Quickstart' software program to guide the implementation of ICTG. - ICTG implementation should be treated as a project. - Such agreement like the service level agreement (SLA) should be in placed when outsourcing ICT services to external vendors. - Ensure that reasonable channels are in placed within process mechanisms considering the balance between control and speed. - Document all critical processes in ICT. - All documents and manuals in ICT should be updated frequently when necessary.

Communications	▪ Formal committee like ICT steering committee and divisional committee should be in placed.
	▪ Appropriate mechanisms for training of end-users should be in placed such as web-based portals, internal magazines, and one-on-one basis.
	▪ Appropriate communication tools should be used for communication between ICT and end-users like email, telephone, and help desk.
	▪ ICT should collaborate with end-users through trainings and informal meetings.
	▪ Approach executive management members informally through informal meeting or cup of coffee.
	▪ A working committee could be utilised where and when necessary to drive ICT projects.
	▪ A change management plan should be in placed including trainings and meetings with end-users.

Table 6. 1: Summary of Recommended Practices for ICTG Implementation

(Source: Author, 2009)

6.4 Limitations of the Research

The limitation in time and financial resources for the research also leads to limitation in the scope and the methodology of the research. The focus of the research was mainly on finding out the factors that influence the implementation of ICTG in the organisation in order to develop best practices for ICTG implementation. However, there were not enough findings on the impact of the most commented factors found on ICTG implementation.

In addition, the researcher was not able to participate and observe the HOD meeting which was scheduled to later date after the researcher returned from the case organisation due to limitation in time and financial resources. The observation during the HOD meeting would have provided valuable insights into the research with respect to how HOD meeting is conducted in the case organisation. The research would have understood how active the participation of the head of ICT with his role in the HOD meeting whereby more factors would have been identified.

The generalisation of the findings from the research might be an issue because the research is only focused on a single case organisation. However, same research can be repeated on three or more case organisations to improve the validity and reliability of the generalisation of the research findings. A comparison of factors found from each case organisation would be very useful to

formulate common factors as benchmark for developing best practices for implementing effective ICTG in organisations.

In addition, the research was conducted on an organisation from the government sector where factors influencing ICTG implementation found would be different from factors influencing ICTG implementation in organisations from other sectors such as commercial banks and boards due to how each sector value and use ICT to achieve corporate goals. The government organisations are not gearing for profits whereas for commercial banks and boards, profit is one of their main goals. Thus, more research can be conducted on private sectors to compare with the findings from government sector so that a wider coverage of the findings generalisation is achieved leading to developing of better best practices as guidance for ICTG implementation.

The limitation of time and financial resources also restrict the methodology adopted for the research to qualitative approach based on unstructured interviews only. However, to improve the reliability and validity of the findings, a combination of both qualitative and quantitative approach should be adopted. For example, structured interviews and survey can be adopted in addition to unstructured interviews to gain more direct output from the participants as well as quantifying the result from the findings to achieve stronger generalisation.

The research was based on a snapshot of what the situation of the organisation at the time of research. However, future research can be done using action research to involve the researcher as participant in the research to gain better insights and understandings on how the implementation of ICTG is evolved over time as well as factors influencing ICTG implementation.

Furthermore, the target population of the research was mainly on the senior executives' level of the organisation excluding contributions from the operational level of the organisation. Good ICTG is built upon contributions from all levels in the organisation. The impact of ICTG affects everyone in the organisation. Although governance is mainly focused on the decision makers, the people who implement the decisions are also crucial to the success of implementation of ICTG. Without the implementers, those decisions will be ineffective. However, further research can be done with the inclusive of

participants from all levels in the organisation to provide better insights into the factors influencing ICTG implementation.

In summary the main limitation in the research is due to limitation in time and financial resources available for the research. However, these limitations open up opportunities for further research as discussed in the following section.

6.5 Recommendations for Further Research

The limitations given above lay out a foundation for further research in the field of ICTG. Further research can be done to find out the impact of the identified most commented factors that influence ICTG implementation on ICTG implementation to help determine best practices for implementing ICTG. By determining the impact of the most commented factors, a better risk management could also be developed as well.

Further research can also be done to measure the effectiveness of the recommended practices identified in the research in the implementation of ICTG in organisations. By knowing the effectiveness of each recommended practice will determine effective best practices for ICTG implementation and also recommend which practices should be applied at which stage of the ICTG implementation project.

Further research can be done to first assess the level of maturity of ICTG implementation in the organisation as factors found in the research might be correlation with the level of ICTG maturity of the organisation. By identifying factors influencing ICTG implementation per ICTG maturity level, will improve the best practices recommended for practitioners so that practitioners will only select and deploy best practices that are relevant to the stage of ICTG maturity of that organisation.

Finally, the research sets contribution to a foundation for further research on how ICTG stimulate the economy of a country especially in the developing countries.

6.6 Conclusion

In conclusion, this chapter has provided answers to the research questions identified in Chapter 3 as the main learning of the research. Three frameworks for developing mechanisms for structures, processes, and communications are

identified in order to implement effective ICTG in organisations. These frameworks consist of core mechanisms elements. The research finds that both ICT and executive management should review the impact of the most commented factors identified above and try to mitigate the inhibitor factors while encouraging the enabler factors. There are various factors found in the research which were classified into two categories: enablers and inhibitors. The main cause of factors is found to be due to inadequate mechanisms developed for the three main focus areas in ICTG implementation. Hence, it is important that the causes of the factors should be healed in order to gain effective ICTG implementation. The relationship between factors found and ICTG indicates that by encouraging enabler factors while minimising inhibitor factors will result on effective ICTG. A summary of the recommended practices developed from the findings is provided as guidance for practitioners to assist with implementing of ICTG.

The main limitations of the research are due to limitation in time and financial resources which also limits the scope and methodology of the research to qualitative approach only. However, further research opportunities can be conducted in the future including studying the impact of the most commented factors on ICTG implementation. The effectiveness of the recommended practices in ICTG implementation can also be assessed. Furthermore, the research lays out a foundation for further research on how ICTG stimulate the economy of a country especially in the developing countries.

Thus, the research highlights the importance of all factors arising from all aspects of the organisation in order to develop better best practices for ICTG implementation. The field of ICTG is a complex area because it involves human interventions such as decision makings which are subjective to the situation of that organisation. However, there is no perfect solution for effective ICTG implementation but at least there are some controls and guidelines through frameworks and best practices lay out to assist with the implementation of effective ICTG in organisations. The research indicates that by having effective ICTG will help improving the productivity of organisations and as a result, the economy growth of a country will also be improved as well.

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Appendix A – Ethic Approval

MEMORANDUM
Auckland University of Technology Ethics Committee (AUTEC)

To: Brian Cusack
From: Madeline Banda Executive Secretary, AUTEC
Date: 18 December 2008
Subject: Ethics Application Number 08/282 The factors influencing ICT Governance (ICTG) implementation: a case study.

Dear Brian

Thank you for providing written evidence as requested. I am pleased to advise that it satisfies the points raised by a subcommittee of the Auckland University of Technology Ethics Committee (AUTEC) at their meeting on 1 December 2008 and that I have approved your ethics application. This delegated approval is made in accordance with section 5.3.2.3 of AUTEC's *Applying for Ethics Approval: Guidelines and Procedures* and is subject to endorsement at AUTEC's meeting on 19 January 2009.

Your ethics application is approved for a period of three years until 18 December 2011.

I advise that as part of the ethics approval process, you are required to submit the following to AUTEC:

- A brief annual progress report using form EA2, which is available online through *http://www.aut.ac.nz/about/ethics*. When necessary this form may also be used to request an extension of the approval at least one month prior to its expiry on 18 December 2011;

- A brief report on the status of the project using form EA3, which is available online through *http://www.aut.ac.nz/about/ethics*. This report is to be submitted either when the approval expires on 18 December 2011 or on completion of the project, whichever comes sooner;

It is a condition of approval that AUTEC is notified of any adverse events or if the research does not commence. AUTEC approval needs to be sought for any alteration to the research, including any alteration of or addition to any documents that are provided to participants. You are reminded that, as applicant, you are responsible for ensuring that research undertaken under this approval occurs within the parameters outlined in the approved application.

Please note that AUTEC grants ethical approval only. If you require management approval from an institution or organisation for your research, then you will need to make the arrangements necessary to obtain this. Also, if your research is undertaken within a jurisdiction outside New Zealand, you will need to make the arrangements necessary to meet the legal and ethical requirements that apply within that jurisdiction.

When communicating with us about this application, we ask that you use the application number and study title to enable us to provide you with prompt service. Should you have any further enquiries regarding this matter, you are welcome to contact Charles Grinter, Ethics Coordinator, by email at charles.grinter@aut.ac.nz or by telephone on 921 9999 at extension 8860.

On behalf of the AUTEC and myself, I wish you success with your research and look forward to reading about it in your reports.

Yours sincerely

Madeline Banda
Executive Secretary
Auckland University of Technology Ethics Committee

Cc: Ikapote Tavalea ika.tavalea@gmail.com, AUTEC Faculty Representative, Design and Creative Technologies

From the desk of ...
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Participant Information Sheet

Date Information Sheet Produced:
12th November 2008

Project Title
The factors influencing ICT Governance implementation: A Case Study

An Invitation
You are invited to participate in a research which intends to identify the factors that influence implementation of Information & Communication Technology (ICT) Governance in an organisation. The outcome of this research will contribute to knowledge of how to improve the implementation of ICT Governance. Your participation in this research is welcomed.

Participation is completely voluntary and no personal information that will identify you will be collected.

The research is conducted by Ikapote Tavalea, a student who is doing Master of Computer and Information Sciences programme at the AUT University, Auckland, New Zealand.

What is the purpose of this research?
The purpose of this research is to identify the factors that influence the implementation of ICT Governance in the organization. It is hoped that the gathering of this knowledge can help others in the future.

How was I chosen for this invitation?
You were selected for this opportunity to participate because the role and position you have in the organisation is directly concerned with ICT Governance. Your participation is entirely voluntary.

What will happen in this research?
Your responses during the interview will be recorded and analysed by the researcher. The results will be written up as a thesis. No organisation or participant will be identified or will be able to be identified.

What are the discomforts and risks?
As participation is voluntary, no major risks are associated. It is estimated that the participant would have to spend 30-60 minutes for the interview but it is totally up to the participant. You can question the process at any time or request to see your own recording.

How will these discomforts and risks be alleviated?
The participants are informed of the objectives of this study and the time required for the interview enabling participants to decide about participation or not. It is up to you to participate or not.

What are the benefits?
This research will contribute to better understand the factors involve in implementing ICT Governance in the organization so that a more effective ICT Governance

strategy can be used. Moreover, the lessons learned from this research can be utilized in formulating a guide that could be applied not only in similar organisations to Ministry of Finance but also to similar organisations around the world, especially in developing countries.

How will my privacy be protected?

No personal information that would identify participants is collected making it impossible to identify participants. Thus, maintaining the participant's anonymity. All collected information is stored securely and only the researcher and his supervisor have access to it.

What are the costs of participating in this research?

The time cost for the participant is between 30-60 minutes.

What opportunity do I have to consider this invitation?

You have time to consider the opportunity. The interviews will not start for another 4 weeks and your response is needed in the next 3 weeks.

How do I agree to participate in this research?

Participants who will be interviewed are required to complete a Consent form as the agreement for the interview. Consent forms will be provided and collected by the researcher.

Will I receive feedback on the results of this research?

The final thesis will be available for the public at the AUT University library.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, *Dr Brian Cusack, brian.cusack@aut.ac.nz Tel. +64 9 921 9999 x 5208.*

Concerns regarding the conduct of the research should be notified to the Executive Secretary, AUTEC, Madeline Banda, *madeline.banda@aut.ac.nz* , 921 9999 ext 8044.

Whom do I contact for further information about this research?
Researcher Contact Details:

Ikapote Tavalea
Email: ika.tavalea@gmail.com

Project Supervisor Contact Details:

Dr Brian Cusack, brian.cusack@aut.ac.nz Tel. +64 9 921 9999 x 5208.
AUT University, Private Bag 1142, Auckland 1142, New Zealand.

Approved by the Auckland University of Technology Ethics Committee on *type the date final ethics approval was granted***, AUTEC Reference number** *type the reference number***.**

Consent Form

Project title: **The factors influencing ICT Governance implementation in the organisation: A Case Study**

Project Supervisor: **Dr. Brian Cusack**

Researcher: **Ikapote Tavalea**

○ I have read and understood the information provided about this research project in the Information Sheet dated 12th November 2008.

○ I have had an opportunity to ask questions and to have them answered.

○ I understand that notes will be taken during the interviews and that they will also be audio-taped and transcribed.

○ I understand that I may withdraw myself or any information that I have provided for this project at any time prior to completion of data collection, without being disadvantaged in any way.

○ If I withdraw, I understand that all relevant information including tapes and transcripts, or parts thereof, will be destroyed.

○ I agree to take part in this research.

Participant's signature: ....………………………………

Participant's name: ....………………………………

Participant's Contact Details (if appropriate):

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Date:

Approved by the Auckland University of Technology Ethics Committee on 18th December 2008 AUTEC Reference number 08/282.

Note: The Participant should retain a copy of this form.