INFORMATION TECHNOLOGY GOVERNANCE

IN THE PUBLIC SECTOR

A thesis submitted for the degree of Doctor of Philosophy

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ABSTRACT

Information Technology Governance (ITG) is one of the most innovative practices through its provision of support for decision-makers in organisations. Interestingly, it has increasingly become a de facto strategy for organisations that are seeking to optimise their performance. ITG has emerged to support agencies in the integration of information technology (IT) infrastructures and the delivery of high-quality services. On the other hand, decision-making processes in public sector organisations can be multi-faceted and complex, and decision-makers play a major role in the adoption of innovation and technology in the government agencies.

While formally adopting IT governance (ITG) has numerous reported benefits, many studies have shown that few organisations have adopted the ITG practice, particularly in the government sector. Therefore, this study attempts to identify and understand the dimensions that hinder ITG adoption and its successful use. The main objective of this research is to investigate and develop a theoretical model of the obstacles preventing formal ITG adoption, from both institutional and individual perspectives.

Based on empirical evidence gathered via semi-structured interviews (n=32) with IT directors in government organisations as a qualitative inquiry, this study attempts to investigate institutional and individual dimensions that impact decision making for the adoption of ITG in the context of the public sector in development countries such as Oman. Furthermore, this study focuses on combining institutional and individual perspectives to explain how individuals can make decisions in response to institutional impacts via the integration of theories such as Institutional Theory and

the Theory of Planned Behaviour (TPB). It also explores the key dimensions that influence decision-making in the public sector concerning the adoption of ITG.

The findings of this study illustrate and analyse the institutional and individual dimensions that impact on decisions for the adoption of ITG and contribute to the body of knowledge by highlighting the dimensions impacting decision-making for adopting ITG in public sector organisations. In doing so, this study contributes to better understand the applicability of integrating both TPB and IS theories to explore and develop a model of ITG adoption in the public sector organization and advances the scholarship by developing a more holistic model.This adoption has benefits such as reaching organisations' strategic goals, improving performance and conferring other competitive advantages.

As a final point, this study advises accelerating the adoption of ITG to increase the efficiency, productivity and transparency of government work as well as to make available integrated smart electronic services. Further studies on the adoption of ITG in the public sector in different contexts, or comparative research, may help to develop a deep understanding of the value of ITG innovation in government organisations to enable evaluation of its significance in enhancing e-government.

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ABBREVIATIONS

Abbreviation	Full term
ITG	Information Technology Governance
IT governance	
ICT	Information and Communication Technology
E-gov	Electronic Government
E-government	
PS	Public Sector
ERP	Enterprise Resource Planning
IS	Information Systems
IT	Information Technology
TPB	Theory of Planned Behaviour
ISO	International Organisation for Standardization
DM	Decision making
PS	Public sector organisations
PSO	
COBIT	Control Objectives for Information and Related Technologies
ITIL	Information Technology Infrastructure Library
ISACA	Information Systems Audit and Control Association
ITGI	IT Governance Institute
GCC	Gulf Cooperation Council
OECD	Organisation for Economic Cooperation and Development
TMS	Top Management support

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PUBLICATIONS AND CONFERENCES

Journal Paper (1):

Al-Farsi, K., & Haddadeh, R. E. (2015), Framing Information Technology Governance in the Public Sector: Opportunities and Challenges, International Journal of Electronic Government Research (IJEGR), 11(4), 89-101.

Conference Paper (2):

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Conference Paper (3):

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Journal Paper (4):

Al-Farsi, K. & Dey, Bidit & et al. (2017), Adoption of Information Technology Governance in the Public Sector orgnasations, (**in progress to submission).**

Chapter 1: **Introduction**

1.1 Overview

Information Technology Governance (ITG) is necessary for every successful organisation and it aims to ensure the best performance for information technology systems in order to support the enterprise in achieving its strategic objectives (ISACA, 2012). In particular, organisations that become fully reliant on information technologies for performance improvement can gain competitive advantage. defined ITG can be defined as a subset of broader corporate governance, as it focuses on the roles played by information technology within the organisation and is considered as one of the principal concerns in recent governance literature (Debreceny & Gray, 2013; Debreceny, 2013).

Those responsible for governance within a business are leaders and decision-makers who understand this ITG technique. In addition, identifying best practices may help an organisation to achieve ultimate control over information technologies, communications and employment in its service facilities. According to Van Grembergen et al. (2008) and Ali and Green (2007), IT governance mechanisms use a combination of processes and structures.There are several tools associated with this innovation, such as IT policies, information security risks, inefficiencies and costs, which may have adverse effects on business establishments and can potentially threaten their stability. Therefore, some ITG models have emerged, including COBIT, ITIL and ISO 27001/2. According to ISACA (2012), Control Objectives for Information and related Technology (COBIT5) is the latest version of

the ITG model and is globally accepted. It creates value for organisations and follows best practices using analytical tools and models. It embodies the leadership and direction of businesses, information technology and government experts (ISACA, 2012).

Several researchers have reported that there is a lack of management support in IT to aid businesses in planning and implementation (Suluo, 2003; Bakari, 2007; Nfuka et al., 2009). Furthermore, there is a lack of clear IT governance policies, principles, IT management support and relationship between IT and business (Lee, 2008; Nxele, 2009;). In addition, senior management and board members are reluctant to take ownership for IT matters because of the difference between governing IT and managing IT (Butler, 2010). Some of them are still uncertain about what IT entails and have a lack of insight into technical components (ITGI, 2003; IBM, 2009).

Winkler (2013) and Ali and Green (2007) claimed that there are few studies of challenges in ITG in the public sector, such as risk management and the issues of information security in IT projects, which may cause failure. Moreover, the costs of IT development and the consequences of a system without any restrictions, standards, and frameworks also need to be taken into consideration in this study. Gartner (2010) viewed some differences in the governance of IT between the public and the private sector. The public sector has more bureaucracy and formal procedures and less flexibility in decision-making (Farnham, 1996; Nicoll, 2005; Shaikh et al., 2007).

Furthermore, decision makers within the public sector in particular are not aware of the value of IT governance and its benefits for reducing costs and avoiding failure (Winkler, 2013). The lack of support from decision-makers leads to delays in framing ITG within organisational strategies in particular. Consequently, it might hinder the

application of ITG in the public sector and create a gap between decision makers and IT managers, which may lead to failure of ITG (Rudman, 2011). Howard and Seth-Purdie (2005) also stated that, “Decision-making is impacted by national policy as well as local community needs.”

According to Debreceny (2013), there is a research gap in IT governance studies with a need for in-depth case studies of successes and failures. Further qualitative research is needed. Gbenle (2013) recommended investigating the relationships between IT governance and leadership using a qualitative approach to gather new ideas for future research studies.

The effectiveness of ITG in the public sector has a long way to go in developing countries (Nfuka & Rusu, 2010). There is a need for several studies in these countries to explore challenges in ITG adoption and the effects of decision makers in developing ITG in the public sector. Thus, to achieve the organisational structure and the decision-making rights (Campbell, 2009).

This study will present a conceptual framework which is closely related to the research context, based on incorporating dimensions that influence the decision-making process in an organisational context in the public sector. This study examines these dimensions in general and those specific to the public sector, and argues that these dimensions may positively/negatively impact the decision-making process while adoption ITG. As well as offering the research methodology utilised to validate the research propositions proposed, the case study findings are analysed and the findings are comparing. More details about the conceptual framework are given in chapter 3.

1.2 Motivation for the Study

Information technology (IT) is widely recognised as a fundamental element in business-related success. Numerous firms worldwide emphasise the importance of IT in not only driving organisational growth, but also supporting and sustaining it (Posthumus et al. 2010). Organisations functioning in the public domain, which are part of the administrative and economic sphere dealing with government service delivery, are among those firms that have welcomed IT as a critical part of day-to-day functionality and the provision of cost-efficient and high-quality services (Ali & Green, 2007). As a direct result of such successes, firms continue to invest in IT-related initiatives to satisfy the requirements of employees, stakeholders and business goals (Preittigun, et al., 2012). In line with this growing dependence and expenditure on IT, IT governance has attracted increasing attention across organisations, particularly those seeking to ensure practical, sensible and value-focused technological investments (De Haes & Van Grembergen, 2009; Rubino & Vitolla, 2014).

Organisations often consider (IT) to be an essential part of their overall strategy. IT policies and practices are crucial for strategy because they ensure that an organisation's use of IT resources is responsible, that risks are managed appropriately and that IT use supports business objectives. IT governance refers to the ways in which decisions are made about IT investments. Problems arise when organisations fail to see a return on their IT investments, but continue to increase IT spending. In such cases, effective IT governance decision-making is crucial for achieving value (ITGI, 2003; ISACA, 2012).

The academic literature on IT governance (ITG) has called for more studies on ITG and the challenges that may hinder its adoption. For instance, Wilkin (2013)

identified some of the challenges related to ITG in the public sector, and Debreceny (2013) noted the research gap in ITG studies, highlighting the need for in-depth case studies of ITG successes and failures. Other studies have recommended that future studies investigate the relationship between ITG and leadership using a qualitative approach to gather new ideas (Gbenle, 2013).

From the other side, Schwenk (1990) and Rodriguez (1995) stated that there are notable differences between public and private organisational decision-making. Specifically, public organisations experience more disturbances, interruptions, turnovers and conflicts (Rainey et al., 1985; Perry & Rainey 1988). The researchers attributed these differences to the societal roles played by public and private organisations. In particular, research exploring the effectiveness of ITG in the public sectors of developing countries has determined that ITG in these countries still has a long way to go (Nfuka & Rusu, 2010). There is a need for more studies exploring the challenges these countries face with respect to ITG adoption and the effects of decision-makers choosing to develop ITG in the public sector and, thus, achieve ITG within the organisational structure and decision-making rights (Campbell, 2009). According to Weill and Ross (2004), the relevant issue is that government decision-makers may lack crucial knowledge of the importance of ITG and information integrity. Therefore, it is necessary to improve staff members' knowledge and skills as organisations become competitive in providing electronic services. Consequently, many organisations struggle to make critical technical decisions, often failing to plan ways to maintain continuity or protect themselves from risks in the long term (Gbenle, 2013). The present study conducts a careful and specific analysis of the impact dimensions within the context of the public sector. The empirical findings show that most of the dimensions impact the decision-making process for IT governance.

The research problem has been established as a clear gap in the limited literature available in the arena of innovation adoption theories and IT governance models. It answers the calls of previous researchers (Gerke & Ridley, 2009; Leih, 2009; Debreceny & Gray, 2013) to extend the research on IT governance frameworks and, in particular, contextualisation and customisation. Moreover, this work further links the theories of IT governance and innovation adoption (Bhattacharjya & Chang, 2006; Jones *et al*., 2010; Parker, 2013).

1.3 Theoretical rationale

In order to analyse and address the identified research problem, this thesis applies a robust theoretical model and examines the issues from a critical perspective to make a substantial and original contribution to the field of knowledge. In so doing, this thesis identifies institutional theory as one of the most cited and applied theories in IT adoption on the organisational level (e.g. Teo et al., 2003; Grimshaw & Miozzo, 2006; Liang et al., 2007; Greenwood et al., 2008; Pollock & Williams, 2008; Mignerat & Rivard, 2009; Berente & Yoo 2012; Zheng et al., 2013; Saraf et al., 2013; Krell et al., 2016; Sherer et al., 2016). Prior research has used institutional theory to analyse a variety of organisations (for examples, see MacGregor, 2004; Mohnnak, 2007; Islamoglu & Liebenau, 2007; Raymond et al., 2012). Over the years, institutional theory has been significantly developed and modified. However, researchers often disagree on the theory's specific construction (see Section **3.2** for more details on institutional theory).

This thesis also identifies the theory of planned behaviour (TPB) as one of the most cited and applied theories in IT adoption on the individual level (e.g. Lee & Kozar, 2005, 2008; Safa et al., 2015; Wimmer & Aasheim, 2017). Like institutional theory,

the TPB is also used to analyse organisations, and it has similarly experienced significant development and modification over time (e.g. Pavlou & Fygenson, 2006; Hsieh, 2015; Rana & Slade, 2016; Ifinedo, 2017). Furthermore, researchers disagree on the construct of this particular theory. It can be said that there are several limitations related to the application of TPB to explain human behaviour. The theory is considered a one-way cognitively based model that omits potential determinants (e.g. economic and environmental impacts). Psychomatric analysis conducted in models such as TPB assumes that behavioural measures are taken simultaneously and does not pay enough attention to the dynamic nature of technology adoption and subsequent use (Dey et al. 2013; Snowden et al. 2006). In addition, the TPB is based on the interrelationships of model structures with only one behaviour and does not account for alternative behaviours (see **Section 3.3** for more details about this theory).

Due to the qualitative nature of some of these scholarly works, institutional theory has also been considered from a more contextual point of view. As a result, some of the theoretical works are not very applicable to a broader context. Considering the limitations of these two well-cited theories, it can be argued that combining the two could offer a new way to address ITG adoption in the Omani public sector. Specifically, since institutional theory focuses on organisational factors and dimensions and TPB focuses on the human factors and dimensions of individuals and society, their combination may provide new insights into how individuals' adoption and use of technology are influenced by both institutions and society (Dey et al., 2013).

1.4 Empirical Context of Study

The Sultanate of Oman is a developing country and a member of the Gulf Cooperation Council (GCC). It is a quickly growing but nonetheless immature nation, and a large proportion (78%) of its population is aged between 18 and 35 years (Salem, 2012). Moreover, Oman is recognised as offering a stable economy, which currently ranks as the 62nd-largest in the world (Schwab, 2015). In 1995, the government of Oman outlined its economic vision 2020, which outlines the need to achieve a digital economy, referred to as e-Oman. In an effort to satisfy this objective, the government has focused on exploiting the potential benefits of ICT in order to enhance digital preparation and readiness levels (ITA, 2014). Essentially, the country's economic stability permits ICT to be harnessed and directed towards growth and sustainable development. In this vein, the field of ICT in Oman has begun to gain momentum (AlShihi, 2006).

According to Azri et al. (2010), of the e-government projects that achieve success, adoption depends on organisational paradigms, technology paradigms and end-user paradigms. In this regard, AlRahbi (2011) identified a number of technical factors that influence e-government implementation success in Oman, noting that the key factors are ICT infrastructure, IT standards, IT security and technical expertise.

Though many different initiatives have been implemented in the field of e-government development and implementation (Sonntag et al., 2002; Valentina & Ndou, 2004; Ashrafi & Murtaza, 2008), developing countries have not always been able to satisfy e-government goals. In the achievement of successful implementation, technological development and public acceptance play critical roles.

A number of developing countries are in the preliminary stages of adopting e-governments with the aim of achieving public sector service improvements. Though e-government efforts in the majority of Gulf countries began in the early years of the 21st century, compared to Western countries, developing nations still face several gaps and challenges in terms of achieving the necessary stages (Al-Busaid & Weerakkody, 2011). Different governments have made significant investments to develop, adopt and maintain e-government portals.

All of the above indicators emphasise the importance of identifying existing challenges, encouraging researchers to engage in further studies about the Omani context. In response to this call, the present research will analyse the dimensions impacting the adoption of IT governance in the Omani public sector.

1.4.1 Background of the context of the Research

The aim of this study is to investigate the dimensions impacting the adoption of IT governance across Omani government organisations. The Sultanate of Oman is the context in which this study is conducted. As a developing state in the Gulf region, Oman has distinctive national, cultural and political characteristics. This study aims to determine the experiences of and practices concerning the adoption of IT governance in Oman to understand and define the issues surrounding such adoption in Omani government organisations.

Several developing countries are still in the early stages of implementation of e-government to improve the effectiveness and efficiency of government services in their public sector organisations. Despite the efforts that have been made to introduce e-government in many Gulf countries, there are still some gaps in the steps necessary to achieve full implementation compared with Western countries,

which have seen huge investments by their respective governments for the development, implementation, and maintenance of e-government.

According to MOI (2016) “The Sultanate of Oman is located in the south-eastern part of the Arab semi-Peninsula, between latitudes 16.40 and 26.30 and longitudes 51.50 and 59.40. Its shore extends from Hormuz in the north to Yemen republic in the south, so it is open to three seas: Arab Gulf, Oman Gulf, and Arab Sea. It is bordered by UAE and Saudi Arabia in the west, Republic of Yemen in the south, Hormoz Bay in the north, and the Arab sea in the eastern border. This location as the figure 1.1 shows has given Oman its historical role in connecting Arab Gulf states with these countries. The population of Oman stands at 4,500,290 million, as of September 2016”.

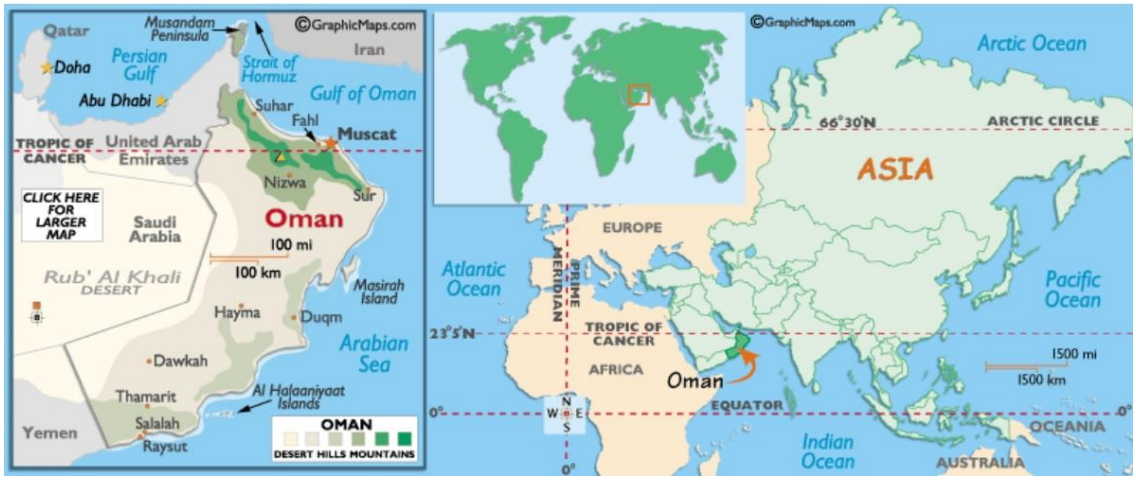

Figure 1.1 The Location of Oman

1.4.2 ICT Strategy in Oman:

The Information Technology Authority (ITA) in Oman has worked since its inception by Royal Decree No. 25/2006 on 31.06.2006 on the implementation of the National Strategy for Digital Omani society and electronic government. It is responsible for

the formulation and implementation of e-government strategies. Its main task is to facilitate and lead the application of e-government services, and thus to enhance the efficiency of the public sector using modern technology and create a society based on digital electronics. Moreover, it helps the ministries and other government agencies in the successful implementation of projects that rely on information technology (ITA, 2016).

Referring to the ITA (2016), the sector of governance and consulting in the ITA aims to ensure that initiatives, projects, and information technology systems are being implemented according to the uniform standards predefined within the framework of the Government of Oman. Furthermore, it instructs all government institutions to adopt these standards and specifications in the application of information technology systems, in addition to providing guidance in the application of the laws of electronic transactions.

According to ITA (2016), e-governance has been defined by the ICT Oman strategy as “the development, deployment, and enforcement of the policies, laws, and regulations necessary to support the functioning of a Knowledge Society as well as of e-Government”. The government of the Sultanate of Oman has made a good start in the use of ICT to achieve its aims and objectives and is structured E-services to offer all its services to stakeholders. Most of the major international organisations in Oman have effective computer systems through which to run their business. Parker and Castelman (2007) state that several large organisations have invested enormous amounts of money in the adoption of IT systems to support their business processes and services.

1.5 Research Aim, objectives and Questions

The aim of this study is *to investigate, examine and analyse the institutional and individual dimensions that impact decision-making in the public sector for the adoption of IT governance.* Within this broad theme, the research has some specific objectives:

- To empirically investigate the key dimensions that can support decision-making for the adoption of IT governance in the public sector.
- To develop and evaluate a model within the field of effective IT governance.
- To provide novel contributions to the body of knowledge.

This study will answer the following main question: *What, how and to what extent do institutional and individual dimensions impact decision-making concerning the adoption of ITG in the public sector?*

Hence, this study attempts to gain a better understanding of the individual and organisational contextual factors that might impact public sector decision-makers in the adoption of ITG. In so doing, this study will investigate the interrelationships involves in Oman's government sector ITG adoption in light of the following research questions:

1. *What kinds of institutional dimensions can impact decision-making concerning the adoption of ITG in the public sector, and how?*
2. *What kinds of individual dimensions can impact decision-making concerning the adoption of ITG in the public sector, and how?*
3. *To what extent do these dimensions impact decision-making for ITG adoption in the public sector?*

This study will offer theoretical perspectives and develop a conceptual model based on two theories—namely, institutional theory and the TPB—to identify and understand the institutional and individual dimensions impacting decision-making regarding the adoption of ITG in the Omani public sector.

1.6 Significance of the Research

Based on the existing literature, one aspect of research is concerned with understanding the impacts of IT governance (ITG) implementation within the context of organisations (Croteau & Bergeron, 2009; Hekkala et al., 2010; De Haes, Grembergen, & Debreceny, 2013; Rowlands et al., 2014). A few studies have also examined and confirmed the relationship between leadership and ITG (Bernroider, 2008; Gbenle, 2013). Gbenle (2013) states there are gaps in the literature regarding the relevance of ITG and leadership practices in organisations. There is also a need to further explore the impact of ITG throughout the implementation process. There are many legal, ethical and inter-organisational or institutional issues that must be investigated concerning the improvements of ITG laws and standards (El-Gazzar, 2014). Furthermore, Debreceny (2013) stated there is a research gap in ITG studies that requires in-depth analysis and further qualitative research.

There are very few studies that investigate ITG in the public sector (in general) or that seek to identify the dimensions affecting decision-makers choices concerning the use of ITG to improve institutional performance. For researchers, this study and its literature review will contribute to the establishment of a conceptual model that determines which dimensions affect decision-making for the use of codified information governance and their impacts on performance in the public sector. The study's use of scientific theories will shed light on all the concepts and practices of ITG in the public sector.

The findings of this study will also benefit decision-makers and practitioners in the field of IT and all parties that use or plan to use ITG. The study intends to help decision-makers gain a better understanding of the importance of ITG in the public sector and identify and understand the various dimensions that impact the adoption and use of ITG. This information will be useful in planning and policy guidance and in the development of plans and strategies to increase awareness of the importance of ITG and its institutional benefits.

This study adds value to the current body of literature by providing more in-depth insight into the ITG framework contextualisation and the effects that innovation-adopting elements may have on ITG, as well as how these effects may be linked to the acceptance and adoption of ITG models. Accordingly, the research contributes further knowledge that will benefit benefit IT professionals, business management and other professionals focused on strategic ITG resources. This work's identification of the dimensions that impact ITG adoption will prove useful for organisations operating across the Omani public sector and will facilitate a greater understanding of ITG and the effects of different models of firms' ITG systems. Ultimately, the work will advise government professionals are advised that the mode of ITG has a key impact on the overall inclination toward ITG adoption.

1.7 Contribution of the Research

From an academic perspective, this research contributes to the existing body of knowledge on ITG adoption in public-sector organisations, specifically the institutional and individual factors that impact adoption, and it offers a model for ITG

adoption that implements existing theories, such as the institutional theory and the theory of planned behaviour.

From a practical perspective, the research will help public-sector organisations classify and understand the dimensions that may hinder ITG adoption and use. The research will also help government institutions understand the importance of ITG and how to adopt it as a successful and effective practice for the organisation. The Main contributions of research are given in chapter 7.

1.8 Thesis Structure

The following sections explain the overall structure of this research.

Chapter 1: Introduction This chapter introduces the area of IT Governance by presenting the background to the topic. The importance of this chapter is that it presents a review of the research.

Chapter 2: Literature Review This chapter presents the background to IT Governance, definitions, challenges and the benefits of IT Governance frameworks, and also presents previous studies related to the ITG field in the public sector and the theories used. The chapter identifies why this topic continues to garner further research.

Chapter 3: Conceptual Model This chapter presents the most commonly used IT Governance model and explains the dimensions investigated based on multiple theories chosen for this study. Further, the IT Governance model is presented by

showing the dimensions investigated from the existing literature and observing the links that exist in practice.

Chapter 4: Research Methodology This chapter is the roadmap that should be followed to convey the research process. The chapter sets out the research strategy, the unit of analysis and the empirical research design followed during the research.

Chapter 5: Data Analysis & Findings This chapter describes and analyses the empirical data collected from interviews with thirty-two IT directors selected from different organisations in the Omani public sector.

Chapter 6: Discussion of the Research Findings This chapter offers an empirical analysis of multilevel perspectives to understand the findings and discusses them in light of the literature review.

Chapter 7: Study Conclusion This chapter presents the main contributions of this research to the body of knowledge, theory and practice. Then it discusses the limitations of the research and makes recommendations for further research.

1.9 Chapter Conclusion

This chapter has presented background information on the nature of the research and its importance as well as the aim, objective, and research questions. It also presents the study motivations, the importance of the study and its contributions. The next chapter reviews the literature on the subject of this study.

Chapter 2: **Literature Review**

2.1 Introduction

This chapter reviews the literature in the study area to identify IT Governance in the public sector. To do so, an extensive review of the research in this field has been carried out, with a focus on investigating the dimensions impacting decision-making for IT Governance in the public sector.

The first section provides a thorough understanding of the study elements to provide a theoretical foundation for the research area and a background to corporate governance, along with an overview of the concepts and approaches of ITG, which form part of corporate governance. Moreover, consideration will be afforded to ITG framework dimensions, which are the structure of relationships, processes, mechanisms, success dimensions and challenges of ITG.

The second section reviews and discusses research related to ITG in public sector organisations, covering contextual differences in the private sector and decision-making processes regarding ITG. It investigates the implementation of ITG in the public sector, seeking to identify success dimensions and methods of effective ITG.

Finally, a critical analysis of ITG in the decision-making process is detailed, along with issues of complexity in decision-making. Studies of decision-making processes are examined in the context of the public sector. Influential dimensions regarding decision-making in the public sector for ITG are also reviewed. The gap in

knowledge and research emphasises the need to investigate the area of ITG by highlighting the levels of dimensions in decision-making processes in the public sector.

2.2 Corporate Governance

The rapid rate of development in the business environment has witnessed shifts in the liberalisation of financial markets and flexible transmission of capital across borders and the breadth and size of organisations has led to a lack of supervision and joint oversight of mechanisms that can assist business organisations and their boards of directors, with many of them finding themselves in financial crisis, which negatively reflects on economies -both emerging and developed. Therefore, there is the need for a response to substantial corporate governance to achieve good governance for business organisations to strengthen their competitiveness.

There are several definitions of corporate governance. According to Organisation for Economic Co-operation and Development (OECD), the definition of governance is 'Providing the structure for determining organisational objectives and monitoring performance to ensure that objectives are attained' (OECD, 1999:9). Moreover, corporate governance can be described as a 'system through which the organisation is controlled, monitored and organised' (Van Grembergen & De Haes, 2009). Additional definitions of corporate governance consider it to be a system that is directed and controlled (OECD, 2004), whilst Webb et al. (2006) describe it as 'the responsibility delegated by stakeholders and the public, defined by legislators and regulators and shared by boards, in some measure, with managers'. The meaning of governance is inferred in different ways with focus on various aspects, such as control hierarchical options and complex networks (Stoker, 1998), economic

management (Santioso, 2001), public authorities (Mayntz, 2003), political communications and processes (Bang, 2003), and contracts of public management (Donahue & Nye, 2002). Referring to Shaw et al. (2014), a corporate governance framework should be transparent, effective, and should clearly indicate the division of responsibilities between supervision, monitoring, and implementation.

According to OECD (2004), the determinants of corporate governance in organisations benefit from the advantages of the application of governance in terms of the availability of a range of determinants, namely external determinants and internal parameters. External determinants include laws, regulations, the efficiency of regulatory bodies and the role of non-governmental parties; internal parameters include applicable rules, administrative structures, and powers and duties.

In specific consideration of the importance of corporate governance, it is recognised as a fundamental tool because it can lead to combating internal administrative and financial corruption in organisations, achieving and ensuring fairness for all employees in the company, ranging from the Board of Directors and executives to the lowest level, facilitating achieving the highest degree of effectiveness of external auditors, ensuring a degree of independence, freedom from any pressures from the Board, reduced errors through the use of controls that prevent such occurrence, and access to institutions' financial statements, characterised by a high degree of transparency and disclosure (OECD, 1999, 2004).

Organisations need to implement governance for a number of reasons, including the need to address errors in their financial structures, the trend towards financial and operational risk management, the need for accounting disclosure, and the trend towards the development of rules for financial transparency. Such decisions need to

be made between the owners and management, involving the entire Board of Directors and all of those with executive power.

2.2.1 Corporate Governance vs. IT Governance

According to Van Grembergen and De Haes (2009), IT Governance (ITG) is a part of corporate governance, and is recognised as one of the innovative practices guiding decision-makers. It is quickly becoming increasingly important for organisations as they seek to achieve the best value performance. IT in governance remains a relatively new field and is not completely developed. There is a need for further work on both the theoretical and the practical side (Jong et al., 2010; Ko & Fink, 2010; Krey et al., 2011; Wilkin & Chenhall, 2010). Owing to increasing regulatory pressures, the alignment of IT and interface decisions in business, ITG is critical about both academia and practice (Buchwald et al., 2014). Figure 2.1 shows the relationship between IT Governance and corporate governance.

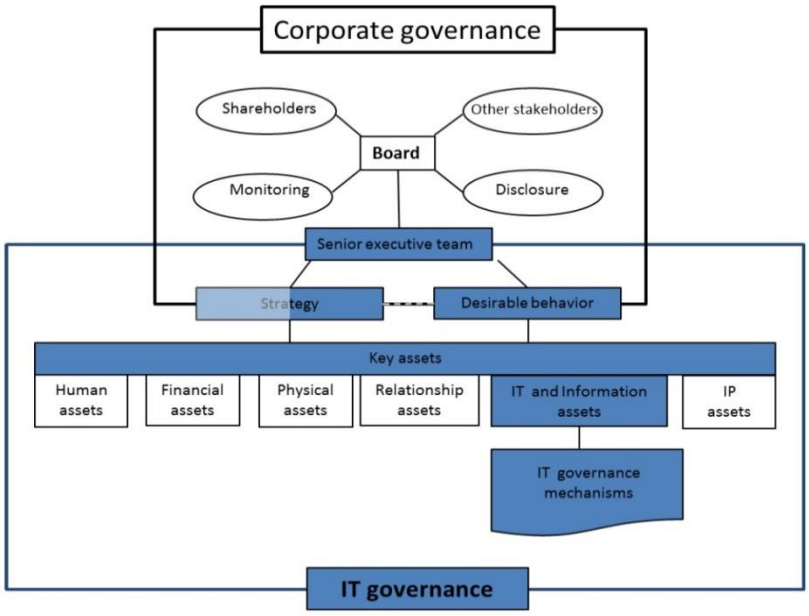

Figure 2.1 Frameworks linking corporate and IT Governance (Adopted by Weill & Ross, 2004)

Weill and Ross (2004) support this trail of evidence by developing a framework that links corporate governance with IT governance. The framework, as illustrated in Figure 2.1 above, demonstrates the connection between corporate governance and the key asset governance, hence IT governance. Right at the top, the board's relationship is depicted. The senior executive team is appointed by the council. Their responsibility is to formulate strategy and desirable behaviour for the organisation. Weill and Ross (2004) see a strategy as a set of choices. Desirable behaviours include embracing the culture and beliefs of the organisation and are defined through strategies, value statements, mission statements, business principles, rituals, and structures. In every organisation, desirable behaviours are different but should be clearly defined because they are the key to achieving effective governance.

Figure 2.1 shows that below strategy and desirable behaviour are six key assets. These assets create business value for the organisation. Below are the assets and examples of each:

- Human Assets - People, skills, career path, training, mentoring
- Financial Assets - Cash, investments, liabilities, receivables
- Physical Assets - Buildings, plant and machinery
- Relationship Assets - Relationships within the organisations as well as with customers, brand, reputation with customers, suppliers, regulators and channel partners.
- Information and IT Assets - Digitised data, information, and knowledge about clients and information systems

- lP Assets - Intellectual Property, including product, service, and process know-how formally patented, copyrighted, or embedded in the organisation's people and systems.

It is vital to govern and use these key assets, as they are vital mechanisms. This governance is a responsibility of the senior executive team. To have joint governance mechanisms for one's assets not only increases integration but also leads to a lesser amount of mechanisms, thus creating more value (Weill and Ross, 2004). This demonstrates that IT governance is part of the overall enterprise governance.

Referring to Teoh (2006), good corporate governance is about accountability because it ensures that organisational goals are achieved. Likewise, good IT governance aligns the IT department with organisational goals and should help to deliver the intended findings. Following this brief overview of corporate governance and how IT governance fits into the bigger governance picture, the stage is now set to look at IT governance.

2.3 IT Governance Concept

Several definitions have been given regarding IT Governance, presented through the completion of past studies: this shows that there is no specific definition of Information Technology governance. The IT Governance Institute (ITGI) defines IT Governance as ‘an integral part of enterprise governance [that] consists of the leadership and organisational structures and processes that ensure that the organisation's IT sustains and extends the organisation's strategies and objectives’ (ITGI, 2003). On the other hand, Weill & Ross (2004) definite ITG as ‘specifying the decision rights and accountability standard to encourage desirable behavior in using

IT.' Table 2.1, below, details several definitions of ITG. It provides details of all the major definitions of ITG to date; however, it is apparent that there is little common ground between them, leaving the subject area in an indefinite state. Also, IT governance is a follow-up to the use of information technologies in the completion of assessments for the important underlying plans of an organisation. Furthermore, IT Governance is centred on assessing and guiding plans in the use of Information Technology to support the organisation.

Definition	**Source**
'ITG is the organisational capacity by the board, executive management, and ITM to control the formulation and implementation of IT strategy and in this way ensures the fusion of business and IT.'	Van Grembergen, 2000
'ITG is the responsibility of the board of directors and executive management. It is an integral part of EG and consists of the leadership and organisational structures and processes that ensure that organisation's IT sustains and extends the organisation's strategies and objectives.'	IT Governance Institute, 2004
'ITG is specifying the decision rights and accountability standard to encourage desirable behavior in using IT.'	Weill & Ross, 2004
'ITG is the process by which decisions are made around IT investments. How decisions are made, who makes the decisions, which is held accountable and how the findings of decisions measured and monitored are all parts of ITG.'	Craig *et al*., 2005
'ITG is the preparation for, making of and implementation of IT-related decisions regarding goals, processes, people and technology on a tactical or strategic level.'	Simonsson & Ekstedt, 2006
'a high priority for many organisations and high-level IT Governance models are being created.'	De Haes & Grembergen,

	2008
'The system by which the current and future use of IT is directed and controlled.'	ISO 38500, 2008
'procedures and policies established to guarantee that an organisation's IT portfolio supports their objectives and strategies.'	Gheorghe *et al*., 2009; De Haes & Grembergen, 2008
'ITG is the process that ensures the effective and efficient use of IT in enabling an organisation to achieve its goals.' 'ITG is composed of processes with the inputs, outputs, roles and responsibilities that are inherent in a process definition.' 'The role of ITG "ensures," as opposed to "executes." The goal of ITG is defined as a business goal, not just IT-related. Key performance measures, identified as effectiveness and efficiency, together represent business value'.	Gerrard, 2010
'it is possible to identify a relationship between ITG performance and business performance, although there are no quantitative studies to prove its existence.'	Simonsson, Johnson & Ekstedt, 2010
'mandatory for organisations due to the significant risks associated with ubiquitous business IT.'	Butler & Butler, 2010; Lin, Chou & Wang, 2011
'IT Governance (ITG) is the process by which organisations seek to ensure that their investment in Information Technology facilitates strategic and tactical goals.'	Debreceny, 2013

Table 2.1 Definitions of ITG

Due to the various definitions provided regarding ITG, there is an understanding of ITG in different situations, although this depends on several dimensions, such as the nature of the study, the environment and the culture, all of which could affect the

suitability of a definition. As a result, considering that IT Governance in an innovative practice, this study follows the definition of Weill and Ross (2004), which suggests that 'IT Governance is specifying the decision rights and accountability standard to encourage desirable behavior in using IT.'

2.3.1 IT Governance vs. IT Management

There is a difference between IT governance and IT management. According to Gallagher and Worrel (2008), IT management is 'the responsibility of executives and managers [to] administer, develop, implement and monitor business strategies on a day-to-day basis.' Also, Van Grembergen and De Haes (2009) state that IT management focuses on effective and efficient IT services and the management of current IT operations. Peterson (2004), on the other hand, defines ITG as being much broader, focusing on the performance and transformation of IT to meet the current and future demands of the organisation (internal focus) and the organisation's customers (external focus), as shown in Figure 2.2.

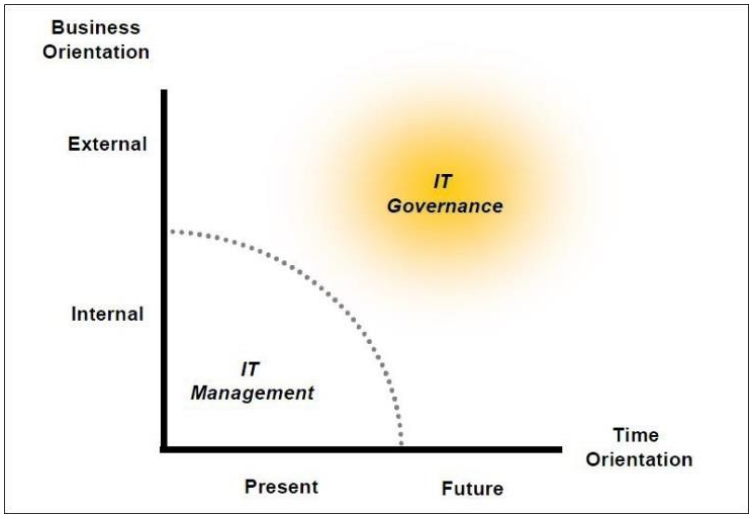

Figure 3.2 IT Management and IT Governance (Peterson, 2004)

In any organisation, there are three layers of responsibility, namely the strategic level, including the Council (Board of Directors); the management level at the C-level (CEO, CIO, etc.) and senior management; and the operational level, which includes Information Technology, business administration, and operational management. Each level needs to be involved in the IT process, ensuring understanding of the role and responsibilities of each (Van Grembergen & De Haes, 2008). Figure 2.3 shows the various levels of responsibility.

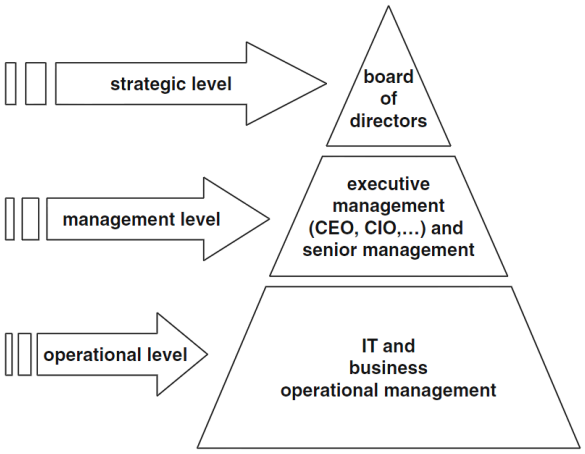

Figure 2.3 The three levels of ITG responsibility
(Van Grembergen et al., 2003)

Referring to Van Grembergen et al. (2003), there are three tiers of responsibility within the organisation, namely the strategic level, the management level and the operational level, as discussed above. These levels communicate with each other to achieve compatibility of IT Governance.

2.3.2 Effective of IT Governance

The effectiveness of ITG is a top priority in business, and warrants additional studies geared towards exploring challenges, implementation, the effects of decision-makers in development, organisational structure and decision-making rights (Gartner, 2013;

Nfuka & Rusu, 2010; Campbell, 2009). Effective governance in the public sector is encouraged to make better decisions and ensure the efficient use of resources, which together strengthen accountability for the management of such remedies. This is characterised by the efficient supervision of a strong audit, which provides significant pressure to improve public sector performance and tackle corruption. Effective IT governance can improve administration, leading to the most efficient implementation of selected interventions to provide better services and ultimately better findings. It is centred on improving people's lives (CIPFA & IFAC, 2013).

The understanding of ITG has been established in the literature (Weill, 2004; ITGI, 2003). ITG is commonly defined as the 'structures of leadership and organisation and processes to ensure that what sustains and extends the organisation's strategies besides the objectives of the organisation' (ITGI, 2003). In the main organisations, ITG has demonstrated that effective structure is a business priority (Gartner, 2013). Organisations that have effective structures in ITG could earn 20 percent more profit than those who do not (Weill, 2004). Essentially, ITG enables superior business, such as action promoting the effective and efficient allocation of resources (Weill, 2004). ITG is considered a crucial component of the overall corporate governance of the organisation (Weill, 2004). Corporate governance tends to focus on the global governance of the resources of an organisation, while ITG, on the other hand, is specifically focused on improving the performance of IT-related resources. This focus on the governance of IT-related resources is derived from the substantial financial resources dedicated to it. The presence of effective structures for ITG in an organisation is, therefore, necessary.

ITG is a multifaceted concept (Brown & Grant, 2005). The literature has been associated with ITG business concepts such as strategic alignment, leadership, risk management, organisational structures, value creation, accountability, and

profitability (Brown & Grant, 2005; Wilkin & Chenhall, 2010). This has resulted in numerous suggestions for effective structures of ITG in the literature (Weill, 2004; Weill & Woodham, 2002). ITG models are not homogeneous (Nfuka & Rusu, 2011). The main line of research relating to ITG tends to focus more on the developed economies. The viability of ITG structures established in the advanced economies is evident because they may be generic and might require considerable effort and costs customised to a specific context (Nfuka & Rusu, 2011).

Understanding the nature of the structures of ITG is appropriate in developing economies, and is a relevant area of examination, with the level of IT investments in these countries rapidly increasing (Gartner, 2013). Despite the influx of these resources, return on IT investments amongst organisations in developing economies remains relatively weak (Cave, 2012). This indicates the importance of effective governance of IT resources, yet such governance still eludes many organisations. This also suggests that many of these businesses might not have adequate knowledge of how to develop effective structures of ITG.

2.3.3 IT Governance Domains

ITG governance focuses on five domains, namely strategic alignment, value delivery, risk management, resource management and performance measurement (ITGI, 2003; Peterson, 2004; Cameron, 2005; Webb et al., 2006). These domains can be described as follows: strategic alignment involves linking the business with a plan for IT; value delivery relates to the value of IT and improving IT expenses; risk management centres on maintaining asset IT, disaster recovery and the continuity of operations; resource management concerns optimal investment in and the proper administration of the resources of critical IT; and performance measurement involves

tracking the completion of projects and monitoring services in Information Technology. Figure 2.4 displays these five ITG content domains.

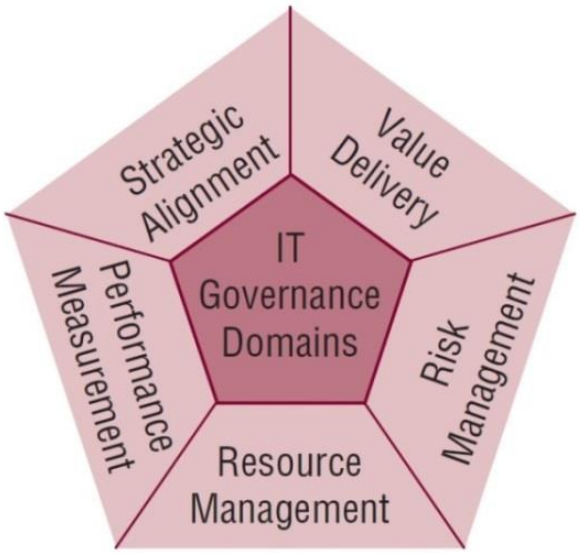

Figure 2.4 IT Governance Domains (ITGI, 2003)

Strategic alignment focuses on ensuring connectivity between business plans and Information Technology, and the identification, maintenance, and ratification of the value proposition of IT and IT alignment between business operations and their processes. Value delivery is concerned with the value proposition and is implemented across the delivery cycle while making sure that technology offers the promise of benefits against this strategy. Its focus is directed towards the costs of improvement and the fundamental value of Information Technology. Risk management requires knowledge of high-risk activities by officials in the company, as well as a clear understanding of the company's appetite for risk and transparency in significant risks for the enterprise, and includes risk management responsibilities within the organisation. Resource management involves optimization towards a good investment of Critical Resource Management Information Technology, involving processes, people, applications, and infrastructure and information. There

are various fundamental issues surrounding the optimization of knowledge and infrastructure. Performance measurement is used to track strategy in terms of the completion of projects, resource utilization, the performance of the process and the provision of services, such as scorecards that translate to business strategy and measurable targets spanning beyond traditional accounting (ISACA, 2012).

2.3.4 ITG Mechanisms:

IT Governance encompasses all organisational issues concerning Information Technology-related policies, such as IT decision-making rights, responsibilities, project approval, IT monitoring and IT delivery value evaluation.

The three necessary elements of ITG mechanisms, as a framework, are structure, process, and relational mechanism. Structure mechanisms are the most obvious mechanisms of ITG. These are defined as the organisational standards and roles that are responsible for decision-making in Information Technology. Operations mechanisms are formal processes geared towards ensuring that daily behaviours are consistent with IT policies, providing input to decisions. Relational mechanisms complete the ITG framework and are paramount to achieving and maintaining IT alignment (Parker *et al*., 2002; Weill & Ross, 2004; Van Grembergen & De Haes, 2008). Figure 2.5 summarises ITG mechanisms.

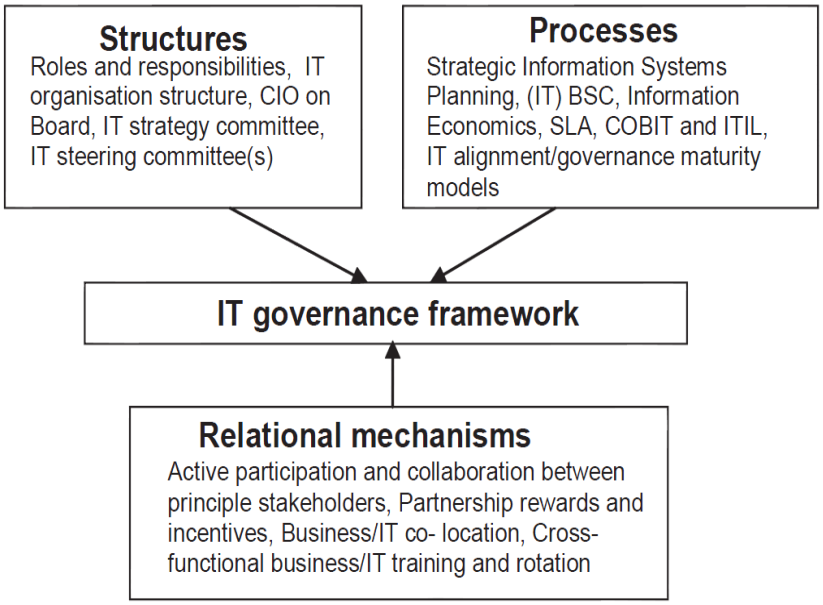

Figure 2.5 ITG framework (Van Grembergen & De Haes, 2008)

According to Van Grembergen et al. (2003), IT Governance can be deployed using a combination of structures, processes, and relational mechanisms, as shown in Table 2.2 below. These mechanisms are not essentially accepted and adopted by all organisations, as their implementation might depend on the nature of the business: for example, different configurations may be developed for each agency. The assumption of these mechanisms can help organisations to ensure the value of IT in business and accordingly to mitigate the risks linked with IT. On the other hand, however, Verhoef (2007) considers that there are various dimensions within organisations, such as lacking ground rules and therefore failing to periodically adjust and align the IT budget with business needs, which will affect organisational performance.

Structures	Process	Relational Mechanisms
Roles and Responsibilities	IT Balanced Scorecards	Active participation by the principle stakeholders
IT strategy committees	Strategic information systems	Collaboration between principle stakeholders
IT steering committees	Planning	Partnership rewards and incentives
IT organisation structure	COBIT and ITIL	Business/IT collocation
CIO on Board	Service Level Agreements	Shared understanding of business/IT objectives
Project steering committees	Information economics	Active conflict resolution
		Cross-functional business/IT training
e-business advisory board	Strategic alignment model	Cross-functional business/IT job
e-business task force	Business/IT alignment models	
	IT Governance maturity models	

Table 2.2 The mechanisms for IT Governance (Van Grembergen et al. ,2003)

According to Dehning and Richardson (2002), the acceptance of IT Governance mechanisms can help organisations to manage and practice the technology they apply with additional efficiency. With businesses lacking in IT Governance, the lack of effectiveness will be mirrored in the performance of the organisation.

2.3.5 IT Governance Frameworks

There are different frameworks designed to provide guidance on the implementation and management of ITG. The most frequently used of these frameworks include ITIL, ISO 27000, Six Sigma, and COBIT works. Figure 2.6, below, shows the percentages of use of IT frameworks according to ITGI (2011).

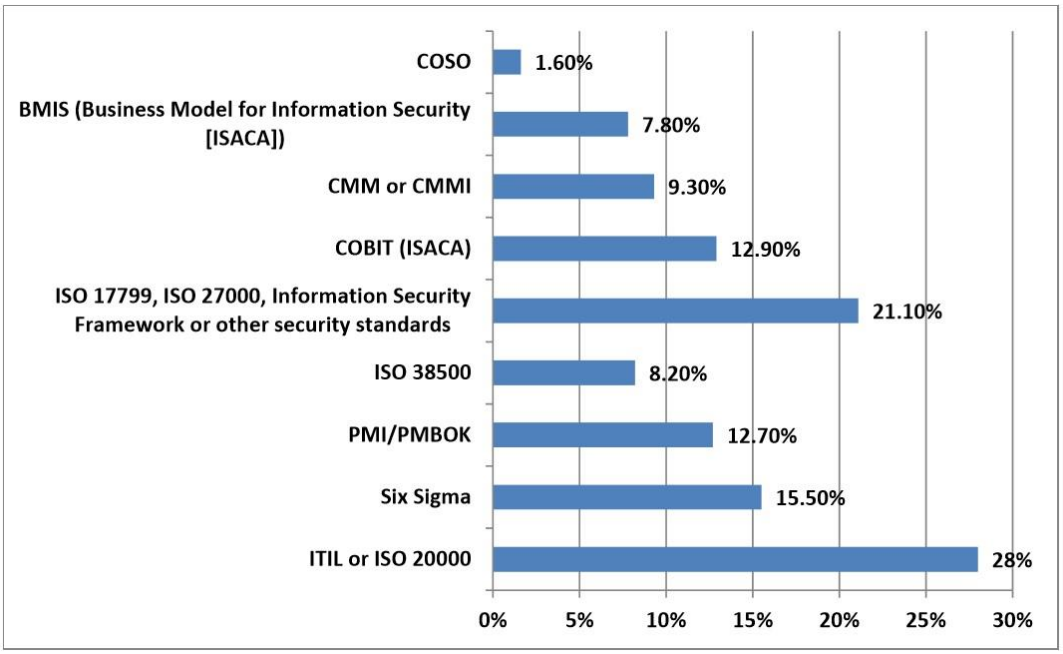

Figure 2.6 IT Governance Frameworks (ITGI, 2011)

Table 2.3 sets out the different frameworks of IT governance that are most commonly used in organisations:

Frameworks/Standards
Information Technology Infrastructure Library (ITIL);
ISO 27002
Six Sigma
Control Objective for Information and Related Technology (COBIT)
Project Management Body of Knowledge (PMBOK)
The Committee of Sponsoring Organisations of the Treadway Commission (COSO)
The Business Model for Information Security (BMIS)
Capability Maturity Model Integration CMMI

Table 2.3 Summary of IT governance frameworks

Irrespective of the frameworks or standards used, user action can coordinate the process of ITG to ensure that it is optimally commensurate with the institution and meets the requirements of the standards of control. Therefore, ITG is a core element that must be considered when reviewing the performance of information technology and the risks associated with it.

2.3.6 IT Governance Success Dimensions:

There many dimensions that can help to support the success of IT Governance in the organisation, including consideration of when to use IT Governance. Pereira and Mira da Silva (2012) discuss ITG contingency, which they define as follows: ‘dimensions that depend on organisation context may impact the ITG

implementation but that are not likely or intended, are a possibility that must be prepared for'. These dimensions include culture, ethics, industry, maturity, regional differences, size, strategy, structure and trust (Pereira & Mira da Silva, 2012). Thus, ITG contingency dimensions need to be considered when implementing IT Governance in organisations, to establish how they impact ITG. Due to increasing regulatory pressures and the need to align IT decisions, management IT has become an important aspect in both academic and practical environments. However, the determinants that affect the outcomes of the success of ITG are still not widely known. Although some studies have investigated the individual dimension of success and the impact of ITG but not combined with these in a widely integrated model.

Several studies have examined ITG success dimensions, including Ribbers et al. (2002), Guldentops (2004), Ali and Green (2005), Bowen et al. (2007), De Haes and Van Grembergen (2008) and Nfuka and Rusu (2011). The recent studies of Buchwald et al. (2014) aimed to achieve an understanding of the dimensions impacting ITG success in organisations, with such dimensions translated into a framework to explain ITG success and its impacts. A more recent study in the area of IT Governance is that of Buchwald et al. (2014), which highlights, through a framework model, the success and impacts of ITG in the private sector. Buchwald et al. (2014) aim to understand what dimensions impact successful IT Governance, and further seek to determine how they can be translated into a model to explain the success of IT Governance and its impacts. Buchwald et al.'s (2014) study utilised a sample of 19 companies across various industries and involved 28 interviews. Their analysis led to the development of a model that helps to gain understanding into what dimensions contribute to successful ITG, and how this contributes to the success of the Foundation of Information Technology Governance and the

organisation's success in general. Therefore, this allows decision makers' regulations to develop the effective implementation of IT Governance and accordingly to explain the implications of successful IT Governance.

A more recent study in the public sector was conducted by Pang (2014), who investigated the value of IT in public sector organisations by examining the moderating effect of IT Governance on the relationship between IT investments and government performance. This study is based on the theory of political control on bureaucracy from the political sciences literature in the context of US state governments. Pang's (2014) findings centred on the impacts of IT spending on national cost efficiency increases, focusing specifically on state Senates' approval of CIO nominations and appointments. It is considered that future research should directly study bureaucracy in IT management with respect to how Chief Executives, business managers and Boards of Directors or legislatures address IT management bureaucracy.

Defining elements of the present study include the fact that it focuses on the public sector and on the dimensions impacting the decision-making processes at the individual and the institutional level. This contributes to solving the problem of complexity and organisational structure in the public sector, as well as the importance of an understanding of ITG among decision-makers.

2.3.7 IT Governance Issues:

The literature has identified several challenges regarding IT governance, which might highlight the issues facing governance of IT in organisations. Table 2.4, below, illustrates the various challenges in three different mechanisms of IT Governance.

Dimensions	IT Governance issues	References
Structures	Committee	Weill & Ross, 2004
	IT steering committee(s)	De Haes & Van Grembergen, 2006; ITGI, 2003; Weill & Ross, 2004
	CIO on Executive Committee	
	IT strategy committee	De Haes & Van Grembergen, 2006; ITGI, 2003
	CIO reporting to CEO	ITGI, 2003; Weill & Ross, 2004
	Architecture Committee	De Haes & Van Grembergen, 2006; ITGI, 2003
	Structure	Meyer, 2004
	IT infrastructure strategies	Weill & Ross, 2004
	Integration of governance/alignment tasks in roles and responsibilities	De Haes & Van Grembergen, 2006; Weill & Ross, 2004
Processes	The establishment of a governance framework	Marks, 2011
	Reference model	ITGI, 2003
	IT principles	Weill & Ross, 2004
	IT policies and procedures	Padmanabhan, 2012
	IT architecture	Weill & Ross, 2004
	Strategic information systems planning	De Haes & Van Grembergen, 2006
	IT investments	Weill & Ross, 2004
	Budget processes	
	Balanced scorecard	De Haes & Van Grembergen, 2006; Kaplan, 1992
	Internal economy	Meyer, 2004
	Methods and Tools	

	Metrics and Rewards	
	IT risk management	Marks, 2011; Padmanabhan, 2012
	IT resources and financial management	Padmanabhan, 2012
	IT performance management	
Relational Mechanisms	IT leadership	Smith, 2006
	Business application needs	Weill & Ross, 2004
	Aligning IT strategy with business strategy	Padmanabhan, 2012
	Stakeholder participation	Rau, 2004
	Communication approaches	Weill & Ross, 2004
	Informal meetings between business and IT senior management	De Haes & Van Grembergen, 2006
	A sense of teamwork	Marks, 2011
	Business/IT account managers	De Haes & Van Grembergen, 2006
	Senior management setting a good example	
	Co-location, Cross-training, Job rotation	
	Knowledge management (on IT Governance)	De Haes & Van Grembergen, 2006; Weill & Ross, 2004

Table 2.4 Issues of IT Governance mechanisms

Moreover, a number of other matters of ITG relate to different aspects, such as culture (Meyer, 2004), cloud computing, continuous auditing and assurance, information security, value delivery through IT (Marks, 2011), organisational readiness (Rau, 2004), value drivers, complexity, capabilities (Peterson, 2004), IT as a strategic resource to deliver value (Padmanabhan, 2012), and organisational,

economic, judicial and technical conditions (Peterson, 2004; Rau, 2004; Weill & Ross, 2004).

Importantly, nowadays, organisations rely on Information Technology (IT) as an essential aspect of the overall strategy of the firm. Accordingly, policies and practices that extend to information technology are an integral part of the strategy, meaning that they must be governed by practices which can help to ensure that information technology resources in the organisation are used responsibly, that risks are managed appropriately and that IT supports business objectives. IT Governance is the method through which decisions are made about IT investments. The problem arises when organisations continue to increase spending on Information Technology but fail to establish a return. Thus, the need for effective ITG decision-making to achieve value has become increasingly urgent (ITGI, 2003; ISACA, 2012).

Previous studies have considered the need for additional research into IT Governance (ITG) and the challenges that could potentially hinder its implementation. Wilkin (2013) mentions some of the problems relating to ITG in the public sector. Similarly, the findings garnered by Debreceny (2013) show a research gap in ITG studies, highlighting the need for in-depth case studies of ITG successes and failures. Other studies have recommended investigating the relationship between ITG and leadership using a qualitative approach to gather new ideas for future research (Gbenle, 2013).

2.4 IT Governance in the Public Sector

2.4.1 The Public Sector vs. the Private Sector

It is important to provide a distinction between the public and private sectors to clarify their degrees of privacy. Legislation states that public sector organisations are owned and operated by the government. The public sector has a special body for public authority legislation governing government agencies. The private sector comprises non-government organisations but may be impacted by the public sector. These impacts include approvals and procedures that should be adopted by the public sector. Table 2.5, below, illustrates some of the characteristics and issues associated with each sector.

Issues for IT Initiatives	**Characteristics of the Public Sector**	**Characteristics of the Private Sector**
Complexity	4+ dimensional world (government, citizens, political imperatives and the media)	3-dimensional world (shareholders, the organisation, and regulatory bodies)
	Increasing demand for 'joined up' projects and key services sometimes delivered through intermediaries.	Projects require consistent IT infrastructure, but the scope of access is more restricted.

Initiatives	Emphasis on announcements and initiatives can proliferate with little or no integration and prioritization.	Market responses drive value: related to integration and prioritization of initiatives; that is, strategic planning.
Culture	'Make decisions correctly' vs. 'make the right choices.'	Focus on decision-making related to strategic, not political planning.
Learning from experience	Weak institutionalised learning with ill-defined accountabilities.	Financial responsibility and demands of regulatory compliance encourage organisational learning.
Risk	Propensity to focus on managing political risk rather than operational and fiscal risk.	Focus on operational and financial risk.

Table 2.5 Differences between public and private sector regarding IT initiatives (Gershon, 2009; Wilkin & Chenhall, 2010; Wilkin et al., 2013).

The public sector spends public money, and how this money is spent and the quality of the services provided are of critical importance to citizens, users, and taxpayers. Therefore, there is a need for good governance of public services, which should maintain a high level of quality. Good governance leads to good management, good performance and the good investment of public money, with good public behaviour and good findings. There are many symbols of governance in public services, which are concerned with providing guidance across all parts of the world, and a complex

variety of public services are provided by the public sector and a range of other agencies. On the other hand, according to previous studies, there are several obstacles facing the implementation of IT Governance in the public sector, such as weak internal policies, external support in government domains, resistance to change, acceptance of new policies, standards and responsibilities, a lack of clarity about the principles and policies surrounding the adoption of IT, a lack of government support units for the management of IT, organisational culture, financial resources, a lack of communication and coordination between the different administrative levels, and a lack of ITG support and priorities concerning Information Technology.

According to Lane (1995), the public sector is a part of the economic and administrative life that provides government services by and for the government, whether national, regional, local or municipal. The public sector has different characteristics than the private sector: the public sector serves all citizens through the exercise of its powers, duties, and functions in the public domain (Elpez & Fink, 2006). Furthermore, profit is not the main objective of public-sector organisations, and they are not based on competition with rivals (DeLooff, 1996; Sethibe et al., 2007).

Nevertheless, the extent of the problems in the public sector is often much broader than in the private sector (Lane, 1995; Boyne, 2002; Nicoll, 2005; Lawry et al., 2007). This refers to the distinction that characterises the public sector, such as the existence of more bureaucracy, such that most of the formal procedures for making decisions are relatively less flexible (Farnham & Horton, 1996; Nicoll, 2005; Shaikh et al., 2007). Furthermore, there is a lot of red tape, which can be counterproductive, and which depends more on the operations carried out regarding outputs and outcomes (Lane, 1995). Lower administrative autonomy allows freedom for

managers to respond at least as they see fit, such as through incentive issues, employment and performance (Boyne, 2002; Nicoll, 2005; Lawry et al., 2007). In addition, there is the concern of wider accountability due to the environment of general internal work and the demands of the general population (Lane, 1995; Sethibe et al., 2007), and the constantly changing legislative requirements and expectations (Liu & Ridley, 2005; Shaikh et al., 2007).

Such differences, and their previously reported problems, can be related to IT and growing application dependency, and to the importance of IT in providing public services, leading to the specific needs and approaches to ITG in the public sector (Loukis & Tsouma, 2002; Liu & Ridley, 2005; Sethibe et al., 2007). This is also due to improved ITG practices and the ways in which they vary across sectors (Ribbers et al., 2002; De Haes &Van Grembergen, 2008).

According to the study of Juiz et al. (2014), IT governance frameworks have been seen to implement the core principles of worthy corporate governance, particularly in the public sector. The study found that there are many links, expressed explicitly and implicitly through a set of IT Governance tools, which match the proposed principles of good governance, with behavioural objectives for the implementation of the IT Governance framework. The context of IT Governance in the public sector mutually reinforces the core principles of good governance, especially the objectives of transparency and accountability of IT assets.

2.4.2 The E-government Concept

The e-government concept has many definitions and interpretations; however, it is often defined as a global phenomenon that uses information and communication

technology (ICT) to transform all public services into more effective, simpler electronic services (Deng, 2008; Wangpipatwong et al., 2009). According to Karunasuna and Deng (2011), the government should facilitate the use of electronic services between citizens, government agencies and commercial businesses. E-government simplifies the delivery of services and information through ICT, such as the Internet. Studies indicate there are three types of e-government initiatives: government to government (G2G), government to citizens (G2C) and government to business (Evans & Ellen, 2006; Palvia & Sharma, 2007). The government's initiatives seek to achieve immediate, direct and available access to ICT for improving the delivery of public services; however, these initiatives may require extensive effort and time to achieve the desired goals (Karunasena et al., 2011; Karunasena & Deng, 2012; Al-Mamari et al., 2013).

There are many advantages and benefits to be gained from an e-government delivery of government service initiatives, and the application and adoption of e-government improves efficiency and effectiveness. Therefore, the interaction between government, citizens and businesses provides a simpler, smoother delivery of public services (Holden et al., 2003; Basu, 2004; Deng, 2008). The transformation phase during the e-government development is focused on providing a single point of contact for all government services (Karokola et al., 2012). The transformation phase also facilitates the smooth flow of information and the close cooperation among shareholders in the decision-making process (Azam et al., 2013; Dombrowski et al., 2014).

The spread of government e-services in a random way causes more administrative fatigue in the government body rather than providing effectiveness and transparency. Hence, ITG is an effective tool supported by a legal framework to ensure that targeted e-government services will be integrated and harmonised to improve government performance.

2.4.3 Innvation Adoption

Innovation may be defined as 'an idea, practice, or object that is perceived as new by an individual or other unit of adoption', as highlighted by Rogers (2010:11). Essentially, innovation is seen to progress through a lifecycle that is initiated with an introduction, with subsequent phases of development, maturity and decline then experienced. In regards the link between innovation and IT, Schubert (2004) states that IT's history monitors how people apply scientific innovations. Overall, innovation is presented in an effort to fulfil the needs held by people, businesses and societies. More commonly, the implementation of IT innovation amongst PSOs is driven by ever-growing employee productivity and organisational capability, the need to improve business performance, and the goal of achieving more profit, such as through making cost savings (Chircu & Lee, 2003). IT innovation adoption can be further explained as 'the first use or acceptance of a new technology or new product' (Khasawneh, 2008), whilst diffusion, on the other hand, may be explained as 'the process by which an innovation is communicated through certain channels over time among the members of a social system' (Rogers, 2010:5). When considering the difference, choices made in regards innovation adoption tend to come before any diffusion-related decisions (Quaddus & Xu, 2005).

Despite the fact that other works have been carried out in regards innovation implementation, estimations and explanations on the role of adopter behaviour

continue to be a point of interest warranting further examination (Vannoy & Palvia, 2010). Accordingly, studies in IT innovation implementation have centred on a key number of theoretical frameworks, all of which aim at providing an explanation of target adopter perspectives and their innovation-related behaviours (Gallivan, 2001).

2.4.4 IT Adoption Process in the Public Sector

The literature shows the key dimensions that may impact the adoption of Information Technology, such as the perceived benefits, ease of use and attitude. As well as the discussing the adoption process, there is a need to describe the steps, tasks, and functions briefly. According to Rogers (1995), the adoption process can be defined as 'the process by which an individual or other decision-making unit passes from first knowledge of an innovation to forming an attitude toward the innovation, to a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision'. The individual or the organisation is aware of this process, as well as its intentions and the use of innovation, meaning that its acceptance and adoption involve a deliberate use of innovation behaviour (Frambach & Schillewaert, 2002).

On the other hand, other studies show awareness in the first stage of the adoption process (Cooper & Zmud, 1990; Marcus & Tanis, 2000). The adoption by the organisation happens between the initiation and the implementation phase. Initiation of the sub-steps, such as the awareness stage and the evaluation, consideration and implementation phase, is the acquisition and use of Information Technology (Frambach & Schillewaert, 2002). IT decision-making is considered at the implementation stage in deployment models that are not only accepted but are implemented with continued use (Hoff & Monroe, 1985). The move is due to be published by the stage at which continuous success is used for a period

(Bhattacharjya, 2008). However, this stage is a step ahead of adoption, which is used to confirm the usefulness of IT.

According to all models of IT adoption, the adoption process is sequential, is conducted over a given period, and is primarily a linear process. Moreover, the conclusion is that the IT adoption process is characterised is a combination of consciousness, intention, and stages of continuous use, through which organisations or individuals enter the IT adoption process. Consciousness, intention, and judgment are the pre-made stages that help in making the decision to adopt IT. This suggests that these dimensions are impacting decision-making that leads to the adoption of IT decisions.

Several types of research have been centred on the adoption of IT at both organisational and individual levels. At the level of organisational studies, the process of the diffusion and adoption of IT has been analysed (Pervan et al., 2005), with the assumption that IT improves the operations of the organisation and the strategic practices. Likewise, various studies have examined the impact of the key dimensions on the adoption of IT. According to Brown and Grant (2005), there are several main dimension classifications that may impact the adoption of IT, such as organisational, technological, environmental and individual dimension.

In the organisational context, the organisation's features, its size, the support of senior management, existing resources and IT experience are all considered material. In terms of the technological context, perceived benefits, cost, complexity, and compatibility are the main determinants of IT adoption. Competitive pressure, business partners and customers' demands, government support and environmental uncertainty are all recognised as environmental dimensions. Individual dimensions could also be identified as critical aspects.

Public organisations have adopted this approach due to its benefits in terms of improved performance capabilities and efficiencies. In recent years, tremendous growth has been witnessed in the adoption of IT in the public sector; in the UK, for example, adoption has been very popular and has been realised as an inevitable solution to the provision of services to citizens at a lower cost (Beynon-Davies & Williams, 2003). According to Brown and Grant (2005), there is strong investment by the public sector in IT, which makes it the largest consumer of IT in the country. The initial adoption of IT was limited to administrative tasks in the public sector, which were then transferred to outsourcing with the proliferation of IT and reputation for efficiency performance (Brown and Grant, 2005). Subcontracting has also been highlighted as a major dimension that circumscribes IT adoption, such as the lack of internal IT support staff. However, with the understanding of the prerequisites for process efficiency, access to public services, transparency and citizen empowerment (Schware & Deane, 2003), the number of governing bodies adopting IT has been increasing sharply.

The review of the literature on IT adoption and the organisational dimensions that impact it has shown that research has been conducted on different dimensions, with consideration of the effects of the organisational relationship between the dimensions and IT adoption (Brown and Grant, 2005). This study will consider the impact of these dimensions on decision-making at organisational and individual levels, based on a number of theories that can support the study and help to develop a suitable conceptual framework. Accordingly, the main objectives of this study are to identify key dimensions for understanding effective IT Governance in the public sector and how the decision-making perspective is significant in the acceptance of technology in government organisations.

2.4.5 Examining IT Governance in the Public Sector:

According to Ali and Green (2007), public sector organisations have recognised the significance of effective ITG in success. This is mostly owing to ITG practices surrounding the mechanisms, criteria, and issues impacting effective ITG. One study looked at ITG mechanisms in terms of the parts of structures with a focus on the roles, responsibilities, and future of IT managers in the public sector (Lawry et al., 2007). It found that because of the context in which the public sector operates, there are various similarities but also significant differences, such as its dependence on rules and procedures, and less managerial autonomy. These differences resulted in the adaptation of a measurement model of CIOs specifically for the public sector.

Furthermore, the application of ITG mechanisms was investigated in a study conducted by Ali and Green (2007) in the public sector in Australian organisations. The study focused on four individual IT Governance mechanisms that are seen to impact the overall effectiveness of IT Governance in public-sector organisations. It revealed an important relationship between the reality of a strategy committee and corporate communication systems, and effective IT Governance in public-sector organisations (Ali & Green, 2007). Moreover, an additional study concerned the maturity of practices, analysing IT Governance and IT controls from the perspective of the public sector (Liu & Ridley, 2005). This study's maturity model was applied with the objective to measure the maturity levels of fifteen of the most important IT control processes (Guldentops et al., 2002), namely COBIT (ITGI, 2007b)—in this case, in Australian public sector organisations. Amongst other factors, this was attributed to differences in awareness; in general, however, there is a need to improve the common understanding of the significance of IT Governance in both cases.

This is also indicated in a case study of three public-sector agencies in the Australian government, which investigated the awareness and insight of the value of IT Governance frameworks (Warland & Ridley, 2005). The case study showed that despite some practices being in place, knowledge, and understanding of IT Governance frameworks in the organisations investigated appeared to be limited. Considering the concerns of the public sector, the need to increase awareness was noted. The study additionally noted the needs for further research as a contribution to the effective mechanisms for the value of IT Governance frameworks in the public sector.

Additionally, another study was carried out regarding how the top performers manage IT for superior findings, specifically analysing the public sector (Weill & Ross, 2004). This study, related to IT Governance, revealed various dimensions that impact the approach that organisations implement when making decisions concerning successful IT. These dimensions include strategic and performance goals, organisational structure, government experience, size and diversity, and industry and regional differences. Furthermore, the study indicates that the performance of governance in the public sector is less than that of lucrative business by 10%. This was suggested to be the result of the greater difficulty in measuring performance targets and adjustment in the public sector, as also indicated by a study of the frames of value in the public sector (Moore, 1995).

Hoch and Payán (2008) recognised the need to take these dimensions, including industry and regional differences, into account when determining the approach to implementing ITG. They found that ITG Governance is a critical capability for the public sector in terms of increasing value and analyzing the governance of IT in the German public sector. A framework of five dimensions was devised, which allows organisations to identify the model that best suits their own specific circumstances

and institutional design. This also applies to the creation of a baseline to estimate the potential value that can be gained in the redesign of IT Governance for the efficient functioning of IT and the final realization of its value in the public sector.

Another study of IT Governance in organisations from public and private sectors examined the differences between these areas (Sethibe et al., 2007). It showed that although there are similarities between public and private sectors, there are also characteristic differences. It has been suggested that a one-size-fits-all approach would not be appropriate when studying the two areas, as indicated by Khalfan and Gough (2002). Likewise, given the scarcity of empirical research in this area, it has been suggested that new studies be geared towards addressing IT Governance approaches that are seen to work best in a public sector context. These studies include an examination of new organisational practices and success dimensions to consider the effective implementation of IT Governance in improving the delivery of public services.

Several studies highlight the critical success dimensions (CSFs), which are 'a limited number of areas in which satisfactory findings will ensure successful competitive performance for the individual, department or organisation' (Rockart & Van Bullen, 1986). CSFs are used to draw attention to the dimensions defining central key areas in which organisations should invest their time and resources to ensure that they successfully achieve their objectives (Ward & Peppard, 2002; Caralli, 2004). Due to their critical importance, CSFs have been widely investigated (Gil-Garcia & Pardo, 2005; Tan et al., 2009) in several organisations from different points of view, ranging from specific projects to the organisation's strategic direction (Esteves, 2004; Fortuna & White, 2006).

However, in the field of IT Governance—taking into account CSFs as essential elements for effective application—there have been few studies of CSFs. IT Governance has become central to most organisations (Sethibe et al., 2007). These include the study by Guldentops (2004), which showed five CSFs for governing IT. The study focused on committees, aligning IT and business strategies and operations, goals and strategies cascading through the enterprise, applying best practices, and the implementation of a framework for ITG. Also, ITG has established several CSFs in all sectors, with an emphasis on IT as an integral part of the organisation.

This also applies to awareness amongst those people who are involved in and communicated with throughout the organisation (ITGI, 2003). ITGI funded a study of ITG in practice, involving fifty CIOs who highlighted six CSFs (ITGI & PwC, 2006b). These CSFs include communication, support from senior management, change management, implementation, evolution as opposed to revolution, the definition and measuring of benefits, and avoiding over-engineering. In addition, CSF has been developed especially for ITG in the public sector: for example, Weill (2004) revealed eight CSFs from a study spanning public sectors in dissimilar parts of the world in different contexts, noting that the involvement of senior management, awareness, simplicity and the design of ITG are all integral parts of the company and accountability. In contrast to other studies, the CSFs identified in this study included ownership, transparency, decision-making and providing the right incentives. Furthermore, a study on CSFs relating to IT Governance in the public sector was carried out by an agency of the Australian Government (Tan et al., 2007). This study was based on the ITIL framework, which places much more emphasis on managing IT services and extends previous studies relating to CSF. These include the commitment of top management, which is important for the transformation of the

organisational culture, and a service-oriented approach, which includes the benefits and management performance, change management, awareness, and training. This also indicates the need for guidelines and appropriate relationships with others, as well as the use of a set of integrated tools. As has been noted, these CSFs should be afforded attention when considering ITG for a dissimilar organisation, as conditions might be different.

2.4.6 IT Governance and Decision-making

Decision-making is one of the most significant purposes of directors in all organisations. Amongst the different choices of transmission, strategic decision-making is a complex process that needs to be fully understood before it can be implemented effectively. Managers are often responsible for making strategic decisions in conditions of extreme complexity and ambiguity. For these reasons, in recent decades, some studies have been carried out in efforts to build models to help managers and executives to make better decisions regarding the complex and highly uncertain business environment. Although much work has been done in the field of strategic decision-making, there remains a need for studies about the process and dimensions affecting policy decisions.

Several studies discuss decision-making from different perspectives. For example, Xue et al. (2008) considered how decisions about IT are made and who is responsible for making such decisions. Other studies focus on decision-making rights and accountability on IT principles, IT architecture, IT infrastructure, strategies, business application needs, IT investment and prioritisation (Weill & Woodham, 2002; Weill & Ross, 2004), IT decision-making authority, organisational capabilities, structure, process, and relational mechanisms that result in the alignment between

business and IT (Simonsson & Johnson, 2006), organisational capabilities, authority of decision-making, and security (Itakura, 2007).

Moreover, Luftman et al. (2008) considered the IT decision-making processes of IT business managers at strategic, tactical and operational levels in setting IT priorities and allocating IT resources. Additionally, stakeholder involvement in IT decision-making, motivation, and constraint mechanisms was considered in resolving information problems and maximizing IT revenue (Tu & Zhang, 2008). Furthermore, one study (Smaltz et al., 2007) considered the governing principles and decision rights on IT investments, IT architecture, IT infrastructure and applications.

According to Rollison (2008), the decision-making process in organisations is regularly associated with the behaviour and attitudes of individuals and groups studied at three different levels: first, strategic decisions, which are the impacts of whole organisation. This is one of the most active areas of current management research and has benefited from research traditions such as behavioural decision theory (Papadakis et al., 1998). The second area focuses on decisions by groups that regularly emphasise the dynamics of the decision process, with an impact on the method through which decisions are made, and, in the context of decision-making for technology adoption, the behaviours and attitudes towards adoption, which is recognised as a cognitive process that represents the perspective's active and adverse effects when implementing IT (Au & Enderwick, 2000). The third area deals with decision-making by individuals, which is examined in this research.

Referring to Schwenk (1988), strategic decisions are poorly structured, not routine and are important to the company, in which great general management plays a central role (Hofer & Schendel, 1978). Strategic decision-making is incremental and interdependent, comprising a variety of contextual impacts arising from past events,

current situations and prospects (March 1981; Neustadt & May, 1986). One of the essential features of strategic decision-making is its lack of structure, mainly due to the complexity of policy problems (Mason & Mitroff, 1981). Gamble and Thompson (2009) state that some companies might use strategies that include aggressive moves and management approaches, which are developed to attract and satisfy customers, operations, and business growth, and to achieve performance goals.

Strategic issues can be defined as news, events, and trends that have the potential to impact an organisational strategy (Dutton & Duncan, 1987). Such issues can pose various problems or opportunities for decision-makers. They are significant because they have an emotional impact on the ability of an organisation to achieve its goals or objectives (Dutton & Duncan, 1987). Decision-making on strategic issues is usually preserved as policy decisions and therefore warrants consideration for strategic management. According to Pearce and Robinson (1994), strategic issues usually have the following characteristics:

- They require a lot of company resources;
- They often affect the long-term prosperity of the company;
- They are future oriented;
- They have multifunctional consequences;
- They require consideration of the external environment of the company; and
- They require managing decisions at the top.

2.4.7 Dimensions impacting the Process of Strategic Decision-making:

Different theoretical models of strategic decision processes, which reflect different conceptions of the organisation, have been suggested by various authors (e.g., Mintzberg, 1973; Chaffee, 1985; Lyles & Thomas, 1988; Hart, 1992). These models will differ substantially regarding their underlying assumptions on the context of the decision and the characteristics of the adoption process and are generally impacted by different dimensions. The dimensions impacting strategic decisions—specifically the various stages and processes—can be classified into four main categories:

- Decision-specific characteristics;
- Internal organisational characteristics;
- External environmental characteristics; and
- Characteristics of the management teams.

There is little research focusing on the relationship between the process of strategic decision-making and specific features. For example, Rajagopalan et al. (1993) believe that relations between specific decision dimensions and features of the decision process have received little attention in previous research. According to Papadakis et al. (1998), ‘our understanding [of] the impact of specific characteristics in the decision-making process of the organisation is still very limited.' Moreover, Dean and Sharfman (1993), Dutton (1993) and Papadakis et al. (1998) state that the process of decision-making means that managers in various organisations—or even within a single organisation—see the same internal or external problems very differently. Thus, the nature of the decision itself may be significant and can have an impact on the processes of strategic decision-making.

2.4.8 Process of Decision-making and the Complexity of Decisions:

Each process of decision-making is a process type and, consequently, the process definition is the first step to understanding decisions. Various definitions have been proposed for this process. According to Davenport, Jarvenpaa and Beers (1996), it may be described as ‘a set of activities across time and place, with a beginning, an end, and clearly identified inputs and outputs: a structure for action’, whereas Talwar (1993) describes it as ‘any predefined sequence of activities performed to achieve a pre-specified type or the findings range’.

Saxena (1996) suggests that the decision-making process is ‘a set of interrelated work activities characterised by specific inputs and value-added tasks that produce concrete findings.' In contrast, the definition devised by Pall (1987) is more detailed: ‘the logical organisation of people, materials, energy, equipment, and procedures in work activities designed to produce a specified result’.

Despite the differences between these definitions of processes, they all seem to have similar elements—a set of activities, a process input and a process output (Hlupic & Robinson, 1998)—followed in a specific order with a view to achieving a result. Researchers agree that the processes are relationships between inputs and outputs. Entries are 'transformed into outputs using a series of activities that add value to the inputs' (Aguilar-Saven, 2004). The process of making purchasing decisions is no exception, including a series of activities that lead to a choice.

2.4.9 The Complexity of Decisions:

Decisions can be categorised according to the degree to which they are repetitive, routine and complex. Simon (1960) has classified scheduled and unscheduled decisions. Routine decisions are often poorly structured, and decision-makers are required to develop specific procedures to address the problem. They have a clear and objective point of departure, as well as a well-defined process for achieving the goal. This type of decision is referred to as programmed decisions. Moreover, decisions are unique, unscheduled, unstructured and lack pre-specified reference to a known method. This kind of decision-making occurs when the decision-maker is working on a new or recent problem, and when the decision situation is very complex, important or requires an innovative procedure (Simon, 1960; Perkins & Rao, 1990). Furthermore, when people are faced with a decision situation that is unstructured, they look to reduce the decision into familiar sub-decisions (Mintzberg, Raisinghani & Theoret, 1976).

According to Keeney (1982), 'the complexity cannot be avoided in decision-making. It's part of the problem, not just a part of the solution'; however, the degree to which decisions are complex varies. A set of issues contributes to the complexity of the processes of decision-making, such as in regard to multiple objectives that

complicate the evaluation of the degree to which each objective is achieved by the competitive alternatives, difficulty identifying good choices, the intangibility of some dimensions, long-term impacts, the involvement of large groups, risk and uncertainty, reliance on information from others, the presence of several decision-makers, compensation value, attitude to risk, and the sequential nature of decisions.

However, not all of these issues are important in every decision-making event, especially in making purchasing decisions, such as in the case of purchasing online, the difficulty in identifying good alternatives amongst the enormous number of options available, the intangibility of retailers, products and services, and risk and uncertainty, all of which increase the complexity and therefore greatly impact the decision.

As a result, there are several considerations concerning decision-making in relation to IT as a phenomenon, highlighting the need to extend past studies in the IT/IS fields. Accordingly, this study will focus on decision-making in IT Governance.

2.5 Theories in the Field of Study

Several theories have been proposed for studying the understanding of dimensions impacting the adoption of information technologies and especially of IT/IS. These theories include the Diffusion of Innovation Theory, the Technology Acceptance Model (TAM), the Unified Theory of Acceptance and Use of Technology (UTAUT), the Information Technology Adoption Model (ITAM), the Theory of Planned Behaviour (TPB) and Intuitional Theory.

2.5.1 Diffusion of Innovation Theory

The Diffusion of Innovation theory (DOI: Rogers, 1995) is considered to be the oldest adoption theory that analyses the behaviour of decision-making. Initially, the concept was developed by French sociologist Gabriel Commerce and German sociologist George Simmel in 1903 (Rogers, 2003). DOI) theory was subsequently developed and became the underlying concept of technology acceptance models in the literature. It has also been adopted and extended to analyze the adoption of many information technologies (Cooper & Zmud, 1990; Hsu et al., 2006; Eder & Igbaria, 2001).

According to Rogers (1995), the DOI explains the spread technology over time and its dissemination in the culture, and how and why it is taken up and at what speed. Rogers further adds that at company level, DOI suggests that organisations adopt innovation as a result of the impact of an individual characteristic, and of the internal and external characteristics of the organisation. Figure 2.7 shows the diffusion of innovation theory framework (Rogers, 1995).

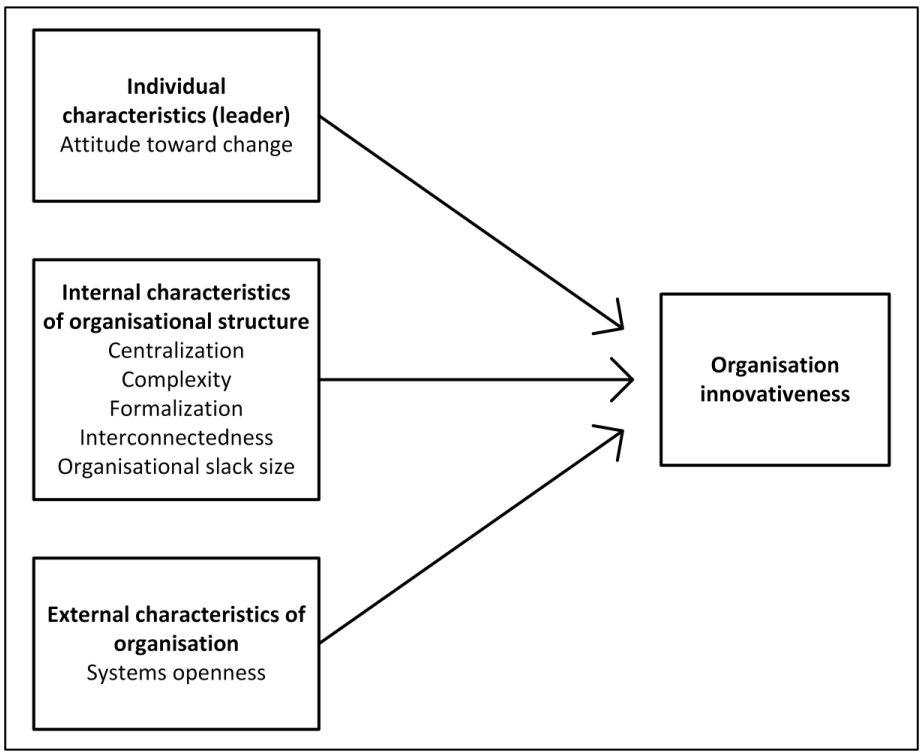

Figure 2.7 Diffusion of Innovation theory (Rogers, 1995)

2.5.2 Institutional Theory:

Institutional Theory is recognised as understanding the impact of external forces on organisational behaviour when adoption is considered (DiMaggio & Powell, 1983), and provides an adequate understanding of the environmental dimensions wherein an organisation is established and their impact on IT adoption (Meyer & Rowan, 1977; Zucker, 1977). On the other hand, DiMaggio and Powell (1983) suggest that there are three external pressures from trading partners, customers, and government organisations, all of which push towards adoption, namely coercive, imitative and normative legitimacy. Coercive pressure is created, formally or informally, by other organisations or by society. Imitative pressure is pressure to imitate the success of other organisations and therefore to adopt the same strategy or technology (Soares-Aguiar & Palma-Dos Reis, 2008). Regulatory pressure plays

a role when organisations consider certain kinds of IT adoption as best practice in the context of the organisation or the specific industry (Soares-Aguiar & Palma-Dos Reis, 2008). Therefore, Institutional Theory addresses the institutional key dimensions forces that exist and how they affect the decisions of an organisation towards IT adoption. Table 2.6 shows the elements of institutional theory.

Theory element	Regulative	Normative	Cognitive
Basis of compliance	Expedience	Social Obligation	Taken for granted
Mechanisms	Coercive	Normative	Mimetic
Logic	Instrumentality	Appropriateness	Orthodoxy
Indicators	Rules, laws, sanctions	Certification, accreditation	Prevalence, isomorphism
Basis of legitimacy	Legally sanctioned	Morally governed	Culturally supported, conceptually correct
Support by	Economists	Early sociologist	Late sociologist
Primary propagandists	North	Selznick	DiMaggio and Powell, Scott
Degree of formality	Formal institutions	Informal institutions	Informal institutions

Table 2.6 The three elements of Institutional Theory (Scott, 1995)

2.5.3 Technology, Organisation, Environment Theory:

Technology, Organisation and Environment (TOE) Theory provides a framework for analyzing IT adoption at the enterprise level. First presented in 1990 by Tornatzky and Fleischer, the model has been adopted and adapted since its introduction (Kuan & Chau, 2001; Teo et al., 2006; Oliveira & Martins, 2010).

It is suggested that the decision to adopt technology is affected by the external environment, the organisation and technology. The external environment is where the organisation operates and faces sociopolitical pressures (Tornatzky & Fleischer, 1990). The context of the organisation refers to its internal characteristics, namely size, structure, and processes, etc. Finally, the technological context encompasses all internal and external technologies associated with the organisation. The framework of TOE theory is illustrated in Figure 2.8.

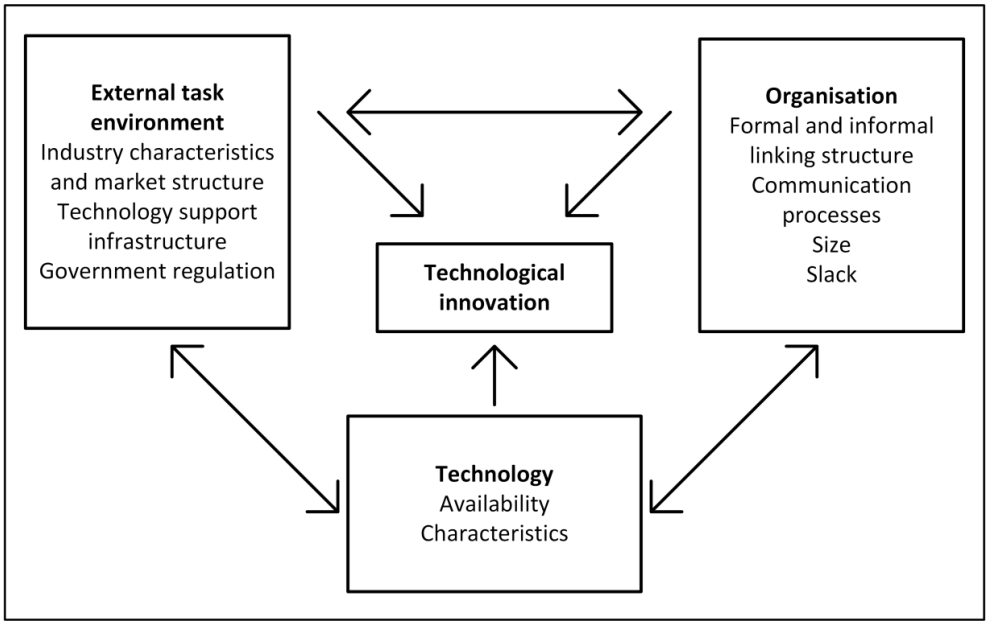

Figure 2.8 Technology, Organisation, and Environment framework

(Tornatzky & Fleischer, 1990)

2.5.4 Theory of Planned Behaviour (TPB):

Fishbein and Ajzen (1975) presented the Theory of Reasoned Action (TRA) one of the first theories to explain the behaviour of user acceptance. According to the TRA, individual behaviour is driven by one's intention to perform a behaviour, which is determined by the attitude of the individual and subjective rules for the conduct in question.

The individual's attitude is determined by his/her relevant beliefs concerning the findings of the performance of the behaviour, multiplied by the evaluation of these results. Subjective norms refer to the perception of the pressure for the individual to perform the behaviour and are determined by the regulations beliefs. Figure 2.9 shows the original TRA, proposed by Fishbein and Ajzen (1975).

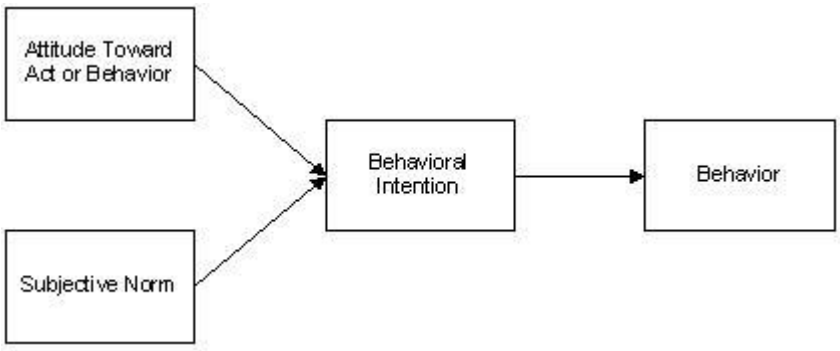

Figure 2.9 Theory of Reasoned Action (TRA) (Fishbein & Ajzen,1975)

The Technology Acceptance Model (TAM) is an adaptation of the TRA, as introduced by Davis (1989), and aims to predict users' acceptance of IT and accordingly to explain the behaviour of individuals in such acceptance. The TAM hypothesises that there are two perceived attributes that impact user adoption, namely 'perceived usefulness' and 'perceived ease of use' (Davis, 1989; Davis et al., 1989). Figure 2.10 illustrates the TAM (Davis, 1989).

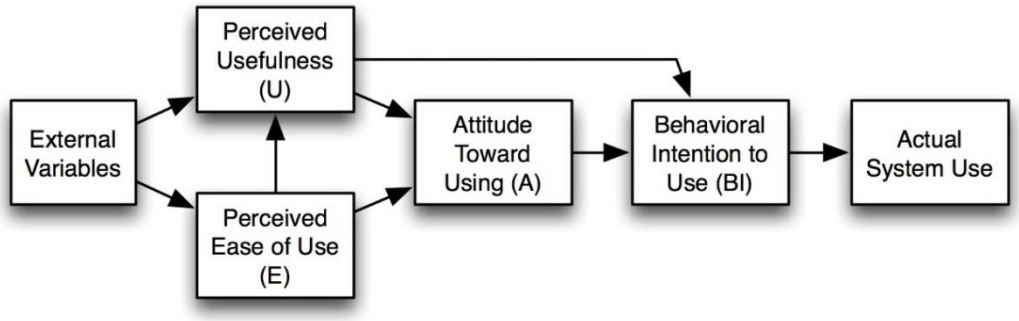

Figure 2.10 Technology Acceptance Model (TAM: Davis, 1989)

Perceived usefulness is 'the degree to which a person believes that using a particular system would improve their performance at work' and perceived ease of use is 'the degree to which a person believes the use of a particular system would be free of effort' (Davis, 1989). These two attributes affect a user's attitude towards the utilization of the information system, where the attitude of a user is directly related to the user's intention, which in turn determines the use of the technology system.

The Theory of Planned Behaviour (TPB) is shown in Figure 2.11 and is derived from the TRA (Figure 2.9). Ajzen's (1991) TRA is extended by adding a new component, namely 'Perceived Behavioural Control' (PBC), as a variable affecting the intention to conduct the behaviour. PBC affects behaviour either directly or indirectly through behavioural intention. Ajzen (1991) argues that, in the conditions in which

behavioural intention has minimal effect on behaviour prediction, only PBC can be used to predict the actual behaviour. Armitage and Conner (2001) show that control belief power (CBP) is an important dimension in predicting behavioural intention and the actual behaviour of TPB—regardless of the effects of attitude and subjective norms.

The TRA, TAM, and TPB provide a theoretical basis for examining the dimensions impacting the person's acceptance of IT and have proven successful in predicting and explaining the use of IT (Igbaria et al., 1997; Venkatesh, 2000). Thus, the TRA, TAM, and TPB can be used to evaluate users' acceptance of IT after the adoption of decision stages.

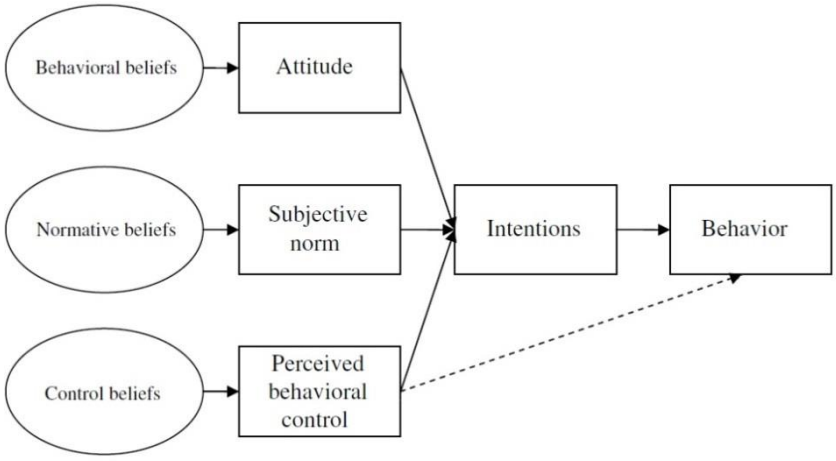

Figure 2.11 Theory of Planned Behaviour (TPB) (Ajzen, 1991)

According to Kim (2013), the Theory of Planned Behaviour (individual motivations) can be connected with Institutional Theory (institutional impacts). Hence, this study's key focus is on the contextual effects of the individual, decisions and the organisation that may impact public-sector decision-makers from the IT Governance

perspective. Therefore, this effort addresses the institutional and individual dimensions impacting decision-making on ITG in the public sector. This study provides theoretical perspectives and develops a conceptual model. Institutional Theory and the Theory of Planned Behaviour are employed in developing this model, with the objective being to understand and distinguish both institutional and individual dimensions impacting leaders' decision-making about ITG in the public sector. This model will explore key influential dimensions of ITG, which is a target of this study.

2.6 Chapter Conclusion

Currently, ITG is an important topic in the field of Information Systems (Rowlands, 2014). Researchers have detailed a wealth of subjects in this field. Previous studies offer different perspectives concerning ITG aspects, such as the dimensions impacting ITG mechanisms and effectiveness (Brown, 1997; Sambamurthy & Zmud, 1999; Ali & Green, 2009; Bowen et al., 2007; Huang et al., 2010), decision-making rights (Brown & Grant, 2005; Weill & Ross, 2004), ITG characteristics (Chong & Tan, 2012), ITG from a structural perspective (Peterson, 2004), ITG process COBIT and ITIL frameworks (Merhout & Havelka, 2008; De Haes et al., 2013) and ITG relations (Van Grembergen et al, 2004; Van Grembergen and De Haes, 2009).

Thus far, based on the literature, one aspect of research is concerned with understanding the impacts of ITG Governance implementation in the context of organisations (Croteau & Bergeron, 2009; Hekkala et al., 2010; De Haes, Grembergen & Debreceny, 2013; Rowlands et al., 2014). Also, a few studies have examined and confirmed the relationship between leadership and the governance of IT (Bernroider, 2008; Gbenle, 2013). Moreover, Gbenle (2013) states that there are

gaps in the literature regarding examining the relevance of ITG and leadership practices in organisations. Moreover, there is a need to further explore the impact of ITG throughout the implementation process. There are many legal, ethical and inter-organisational or institutional issues that need to be investigated concerning the improvements of laws and standards (El-Gazzar, 2014).

Referring to Magno (2011), IT is expected in public-sector organisations, supported by enabling decision-making to increase transparency and accountability and to encourage efficiency in service delivery. Additionally, Xue et al. (2006) state that IT Governance implementation is impacted by internal and external dimensions; however, the literature still does not identify and explore these dimensions (Pereira & Mira da Silva, 2012). Moreover, Frisk et al. (2014) state that there is 'little research on decision-making as a creative process where managers discover and evaluate alternatives.'

Moreover, the literature presents several barriers to formal IT Governance practice, such as a lack of top management support, resistance to change, complexity, low priority, organisational politics, a lack of knowledge and skills, a lack of resources, a lack of awareness, a lack of mandate and a lack of comprehensive documentation. All of these barriers need to be studied to achieve successful IT Governance within organisations.

Several theories can be used to understand IT Governance in the public sector. A combination of Institutional Theory and TPB can show the relationship between the characteristics and activities of the decision-making process by highlighting the organisational and individual characteristics impacting the effectiveness of IT Governance.

Several gaps have been identified in the literature, as shown below:

- The lack of a theoretical framework for the efficiency of IT Governance.
- Insufficient literature on IT Governance from a decision-making perspective.
- Limited investigation to identify contextual dimensions impacting IT Governance.

As a result of this lack of knowledge concerning the approval of IT Governance from individual and organisational aspects, there is a need to identify key dimensions in public-sector organisations that influence the effectiveness of IT Governance, and which accordingly represent an academic challenge. Therefore, it is important to investigate the contextual aspects of the decision-making process (at individual and institutional levels) and fit functional aspects of IT Governance by exploring the key dimensions impacting decision-making in the public sector for effective IT Governance.

2.6.1 Summay of key findings

Table 2.7 shows the Key findings in the literature review as fowling:

Key Findings	**Resources**
There is a lack of management support in IT to aid businesses in planning and implementation	Suluo, 2003; Bakari, 2007; Nfuka et al., 2009
There is a lack of clear IT governance policies, principles, IT management support and relationship between IT and business	Lee, 2008; Nxele, 2009
Still uncertain about what IT entails and have a lack of insight into	ITGI, 2003; IBM, 2009

technical components.	
There are few studies of challenges in ITG in the public sector	Ali and Green,2007; Winkler, 2013
There is a research gap in IT governance studies with a need for in-depth case studies of successes and failures. Further qualitative research is needed.	Debreceny , 2013
The effectiveness of ITG in the public sector has a long way to go in developing countries. There is a need for several studies in these countries to explore challenges in ITG adoption and the effects of decision makers in developing ITG in the public sector	Nfuka & Rusu, 2010
Thus far, based on the literature, one aspect of research is concerned with understanding the impacts of ITG Governance implementation in the context of organisations	Croteau & Bergeron, 2009; Hekkala et al., 2010; De Haes, Grembergen & Debreceny, 2013; Rowlands et al., 2014
Recommended investigating the relationships between IT governance and leadership using a qualitative approach to gather new ideas for future research studies.	Gbenle, 2013
a few studies have examined and confirmed the relationship between leadership and the governance of IT	Bernroider, 2008; Gbenle, 2013

There are many legal, ethical and inter-organisational or institutional issues that need to be investigated concerning the improvements of laws and standards	El-Gazzar, 2014
There are gaps in the literature regarding examining the relevance of ITG and leadership practices in organisations. Moreover, there is a need to further explore the impact of ITG throughout the implementation process.	Gbenle, 2013

Table 2.7 The Key findings

This chapter has analysed the literature in the area of study to understand ITG in the public sector. Research has covered diverse aspects of ITG, such as critical success dimensions (CSFs), impacts, issues and challenges, and culture in organisations. This study will focus on investigating the dimensions impacting decision-making and supporting ITG in the public sector. It will concentrate on the decision-making process at two different levels, which could impact and support decisions regarding the challenges facing technology adoption in general and the acceptance of ITG in particular. The integration of theories in this study will help to explore the key impacts of decision-making in the public sector regarding ITG. This will assist in the building of a conceptual framework in the next chapter.

Chapter 3: **Conceptual Framework**

3.1 Introduction

This chapter discusses the development of the theoretical and conceptual models. Two theoretical perspectives, namely Institutional Theory and the Theory of Planned Behaviour, are used in the development of a conceptual model to understand and distinguish the two institutional and individual dimensions that influence decision-making behaviours. Institutional Theory may go some way towards explaining the context in which decision-making occurs, whereas the TPB may account for the motivations underlining decision-making in IT governance behaviour in an institutional context.

This chapter proposes a conceptual model centred on investigating the ways in which institutional and individual levels influence behaviour in specific regard to decision-making. The behavioural aspect of decision-making can be understood from the perspective of individual motivation and the pursuit of institutions, in line with the legitimacy of the organisation. Institutional Theory (Scott, 2001) provides significant insight into the importance of institutional settings, including the standards of the organisation, norms, and culture in the actions (behaviours) of individuals (Tolbert et al., 1983; Tolbert, 1985). In contrast, the TPB offers its views on how individuals' beliefs impact their behaviour (Ajzen, 1991). Moreover, Battilana (2006) stated that in the relationship between organisations and individuals, organisational or institutional logic is seen to exhibit individual-level action.

3.2 Institutional Theory

There are certain terms that a researcher has to consider owing to their central importance Institutional Theory is recognised as understanding the impact of external forces on organisational behaviour when adoption is considered (DiMaggio & Powell, 1983), and provides an adequate understanding of the environmental dimensions within which the organisation is established and their impact on IT adoption. On the other hand, DiMaggio & Powell (1983) suggest that there are three external pressures from trading partners, customers, and government organisations, all of which push towards adoption, namely coercive, imitative and normative legitimacy. Coercive pressure, which can be formal or informal, is created by other organisations or by society. Imitative pressure is pressure to imitate the success of other organisations and therefore to adopt the same strategy or technology (Soares-Aguiar & Palma-Dos Reis, 2008). Regulatory pressure plays a role when organisations consider certain kinds of IT adoption as best practice in the context of the organisation or the specific industry (Soares-Aguiar & Palma-Dos Reis, 2008). Therefore, Institutional Theory addresses the institutional key dimensions that exist and how they affect the decisions of an organisation towards IT adoption.

This research uses the Institutional Theory as a main theoretical foundation. Institutional Theory was originally devised in an effort to explain organisational behaviour, or why companies adopt similar organisational structures and practices, as well as how they are similar to one another regarding institutional pressures (DiMaggio & Powell 1983).

This is known as organisational isomorphism, which is hypothesised to be the main influence on organisations in terms of achieving legitimacy (Deephouse, 1996). DiMaggio and Powell (1983) argue that the legitimacy of an organisation can help it

to do business with comparable companies by providing access to essential resources. Institutional Theory emphasises how organisations achieve organisational legitimacy rather than productivity or efficiency in institutional settings (Meyer et al., 1977; Scott, 2001).

Institutional Theory can provide valuable insights into how social actors behave as their institutional environment impacts institutional pressures. According to Institutional Theory, social actors are facing external pressures to conform to the common notions of appropriate ways to secure resources and show desirable behaviours and social support by observing organisations' legitimacy (DiMaggio et al., 1983; Tolbert, 1985). Social actors not only take into account the efficiency or productivity of social behaviour (rationality) but also consider the legitimacy of social behaviour (DiMaggio et al., 1983; Oliver, 1991).

3.2.1 Institutions and Institutional Logic

Institutions consider regulations that limit the options of individuals and accordingly provide predictable conditions (Scott, 2001). Institutions may be defined as social structures, including those that are taken for granted, or informal or formal rules restricting social behaviours (Bjorck, 2004). Social structures comprise symbolic elements, material resources and social activities (Scott, 2001). Scott (2001: 48) defines institutions as 'social structures that have reached a high degree of resistance'. The institutions are established through institutionalization, which is the process by which rules and behaviours become taken for granted and validate (Meyer et al., 1977; Tolbert et al., 1983).

Once institutions are established, the limitations that function as genuine guidelines for stakeholders' social behaviour are taken for granted (DiMaggio et al., 1983;

Scott, 2004). Individual beliefs formed from the notions of legitimacy are the foundation of built institutions (Barley, 1986).

Institutional logic, as a shared cognitive framework, can be collectively defined as a group of built assumptions, beliefs, norms and practices. Institutional logic offers individuals the capacity to help interpret their experiences and develop their behaviours accordingly (Friedland et al., 1991; Haveman et al., 1997; Thornton et al., 1999). Institutional Logic, which is evident at different levels and fields, is enacted by institutional actors (Chiasson et al., 2005). Thornton and Ocasio (2008) argue that institutional logical forms individual actions in an organisation so as to provide collective identities, comprising a cognitive culture for community members. Regulatory basis, regulations and, more specifically, scholars of Institutional Theory, also argue that institutional logical forms people's attitudes and behaviours through structuring incentives (Friedland et al., 1991).

3.2.2 Institutional Pressures

According to Institutional Theory, the institutional environment provides social expectations and standards, thus enabling stakeholders to undertake socially acceptable behaviours, develop socially acceptable practices, and accordingly create appropriate organisational structures and operations (DiMaggio et al., 1983; Meyer et al., 1977; Scott, 2001). Stakeholders need to fulfil those expectations and social norms to maintain their legitimacy (DiMaggio et al., 1983; Heugens et al., 2009; Zsidisin et al., 2005).

Institutional legitimacy, as a shared notion of desirable and appropriate action, can be exerted through broader rules and professional standards and taken-for-granted beliefs (DiMaggio et al., 1983; Meyer et al., 1977; Scott 2001). Scott (2001) identifies

these pressures as the three pillars of institutions: regulatory, policy and cultural-cognitive. Social actors have made attempts to adjust to these shared notions of regulatory pressures and regulatory and cultural-cognitive dimensions to achieve and accordingly maintain their legitimacy. Details of these regulatory, legal and cultural cognitive pressures are provided below.

The regulatory pillar includes the coercive aspects of institutions, such as laws or rules, which regulate and limit the conduct of actors (Scott, 2001). This regulatory pillar forces compliance through fear of sanctions for disobedience (Scott, 2001). Regulatory pressures are defined as 'formal and informal pressures on organisations by other organisations upon which they are dependent' (DiMaggio et al., 1983). Such pressures provide individuals with government power or authority, which regulates their behaviour (Scott, 2007).

Previous studies have identified that, at an organisation level, regulatory pressures can be identified as stemming from various sources, namely resources-dominant organisations, such as suppliers, parent companies, and regulatory agencies, including the government (Teo et al., 2003). Regulatory pressures are sometimes written explicitly as rules and sanctions (Scott, 2001).

Regulatory pressures can be defined as a means of legitimacy derived from group expectations in a given institutional context (DiMaggio et al., 1983; Scott, 2001). Scott (2001) argues that regulatory pressures, as collective expectations, are important mechanisms in determining appropriate and legitimate conduct within and across a community.

Collective expectations have become shared standards through training, education and association (DiMaggio et al., 1983), where the main institutions exerting regulatory pressure include the research community, local networks, affiliations and

certification agencies advocating government securities (Heinrich et al., 2004). The actors are likely to adjust their behaviours in line with their beliefs surrounding what views are adopted by others in the community (Deephouse, 1996).

Cultural-cognitive pressure, as a mimetic mechanism, occurs 'when an organisation mimics the actions of other organisations holding similar structurally equivalent network financial positions in the same industry' (Burt, 1982). Cognitive-cultural pressures are seen to have two principal components, where the prevalence of the practice in an industry perceived success of high-status organisations within the industry (Haveman, 1993). Cultural-cognitive push pressures stakeholders into voluntarily and consciously copying one another in successful practices and behaviours because they believe that the more status successful actors share, the more likely they will be to produce positive findings (DiMaggio et al., 1983).

The cognitive cultural pillar is rooted in an institutional context, meaning that it is hard to recognise and identify; in other words, this pillar relates to a shared understanding of reality, which is taken for granted. The actors imitate the practices and behaviours of successful and high status social actors because they believe that the actions adopted by them are most likely to produce more positive findings.

Previous studies based on Institutional Theory have focused mainly on how institutional logic impacts organisations and their structures, while less attention has been directed towards the ways in which institutional logic impacts individuals in institutional settings (Battilana, 2006; Vandenabeele, 2007; Zucker, 1991). Although Institutional Theory considers the behaviour of individuals as being impacted by institutional logic (Scott, 2001), previous studies in the domain of Institutional Theory have not systematically investigated the way in which institutional logical forms the

attitudes and behaviours of individuals (Rupidara et al., 2011; Szyliowicz et al., 2010).

Compared with the perspective of macro-level Institutional Theory (DiMaggio et al., 1983), many scholars argue that Institutional Theory can be applied when examining micro-level institutional pressures and how they influence individuals' beliefs, attitudes and behaviours (Battilana, 2006; Hall et al., 1996; Robinson, 2011; Roth et al., 1994; Suddaby, 2010; Wicks, 2001; Zucker et al., 2004).

Several studies that conduct micro-level analysis of the individual, including the work of Kisfalvi et al. (2011), have been based on Institutional Theory (Carney et al., 2009) and behaviours (Mezias et al., 1994; Sitkin et al., 2005). For example, Cranfield (2007) adopted Institutional Theory to identify personality dimensions and motivation, as well as institutional dimensions impacting the participation of lawyers in pro-bono work. Similarly, scholars have used Institutional Theory in an effort to explain the asset-building behaviours of individuals within a financial programme (Johnson et al., 2010; Ssewamala et al., 2004), and even recognise that individual theories need to be combined with Institutional Theory (Ssewamala et al., 2004). Markedly, a wealth of research has been carried out with regard to the cognitive aspects of Institutional Theory (George et al., 2006; Powell et al., 2008); Institutional Theory has even considered how individual actors can impact institutions (for example, institutional business: Phillips et al., 2007), emphasising the role of actors in shaping institutional processes (Garud et al., 2002; Greenwood et al., 2006; Lam, 2010; Oliver, 1991).

3.3 Theory of Planned Behaviour

In this study, the Theory of Planned Behaviour (TPB) is used as a theory of individual motivation, through which a connection can be made with Institutional Theory. The Theory of Planned Behaviour and its precursor are well-established theories of social psychology, which describe the way in which salient beliefs impact behavioural intentions and subsequent conduct (Ajzen, 1991; Fishbein et al., 1975). This theory provides insights into how an individual's attitudes, subjective norms, and perceived behavioural control impact their behaviour, mediated by intention. With institutional theory, the TPB can explain how individuals make their decisions based on their motivations (Ajzen & Fishbein, 1980).

Additionally, the TPB explains an individual's behaviour based on behavioural intention, which, in turn, is impacted by his/her attitude towards the behaviour and perceptions of subjective standards for behaviour. According to Fishbein and Ajzen (1975), intention of conduct refers to 'a person's intentions to perform various behaviours,' whilst attitude and subjective standards are defined as 'favourable or unfavourable evaluation of a person to an object (or conduct)' and 'the perception of the person that most people who are important to him/her think should or should not perform the behaviour'. Moreover, attitudes and subjective standards are determined by a person's beliefs and standards of behaviour (Fishbein et al., 1975). When referring to behavioural beliefs, the deeply held views of an individual and his/her ideas about the consequences of a proposed behaviour are related to the perceived expectations of specific individuals or groups related to him-/herself (Fishbein et al., 1975).

The TPB is a well-established theory within social psychology, which indicates the specific impact of outgoing beliefs and behavioural intentions and subsequent

behaviour (Ajzen, 1991). Within this theory, perceived behavioural control means 'one's perceptions of his/her ability to represent a certain behaviour easily' (Ajzen, 1991). In TPB, the determinants of behavioural intention include attitudes, subjective norms and perceived behavioural control, which are determined by the structures that underline beliefs, including regulatory and behavioural control beliefs (Ajzen, 1991).

The TPB has a number of limitations: it considers only personal dimensions, as opposed to any institutional or social aspects (Shi et al., 2008). Previous studies using the TPB adopted the decontextualised analysis model at the individual level (Shi et al., 2008). For example, studies using external control of behaviour (i.e. resource condition facilitators) were criticised because they included no individual level construct of theoretically tested models and control models when taking into account external behaviour as the same construct at an individual level (Hsu et al., 2004).

Although the TPB goes some way towards explaining the motivations and actions of individuals, nevertheless, it has its limitations in explaining any contextual dimensions regarding behaviour. As an individual-level theory, it does not fully explain decision-making regarding IT governance behaviour, thus meaning that it needs to be combined with Institutional Theory to explain decision-making in the context of IT governance behaviours within and across institutional contexts.

3.3.1 The Components of the TPB

In the TPB, attitude, behaviour and subjective norms are the key elements explaining behavioural intention. In recent decades, the TPB has been applied in

various social decision-making disciplines and has received significant empirical support.

First, attitude towards a particular behaviour has been found to predict individuals' intention to perform the behaviour (Ajzen et al., 1980; Fishbein et al., 1975). Previous empirical studies have shown support for the relationship between attitude and behavioural intention (Hsu et al., 2008; Pavlou et al., 2006; Wu et al., 2007). For example, technology adoption and use of literature, as well as the relationship between attitude and intention, have received empirical support (Dickinger et al., 2008; Titah et al., 2009). In the literature on sharing knowledge (information), attitude has been examined and found to have an active and significant impact on behavioural intention to share knowledge (Bock et al., 2005; Kolekofski Jr et al., 2003). In this research, attitudinal beliefs are regarded as important motivators with the capacity to influence decision-making behaviour.

Second, subjective norms have been studied in different research areas, including technology adoption (Hsu et al., 2004; Venkatesh et al., 2000), knowledge-sharing (Kuo et al., 2008b; Ryu et al., 2003) and marketing (Swan et al., 1989). As an example, adoption studies from previous technology standards have considered the impact of subjective norms on individuals' intentions to adopt and use technologies (Hsu et al., 2004; Venkatesh et al., 2000). Ryu et al. (2003) found that subjective norms positively impact the intention of physicians to share their knowledge with others in both direct and indirect ways. However, in the real literature, researchers have rarely studied the impact of subjective norms on decision-making.

The third aspect that has been examined is behaviour control, which refers to the perceived ease or difficulty of performing a particular behaviour, and the amount of control over the behaviour that the individual needs to have (Ajzen, 1991). Perceived

behavioural control was introduced to explain situations where people lack volitional control of their specific behaviour (Ajzen, 1991). Ajzen (1991) argues that behaviour might not be controllable: people are not likely to consider what is being performed. Perceived behavioural control can be divided into two smaller aspects: internal control of behaviour (efficacy) and external control of behaviour (conditions that facilitate resources: Ajzen, 2002; Manstead et al., 1998). The control of internal behaviour or self-efficacy is suggested by Bandura (1986) and is defined as the subjective judgments of a person concerning their skills and abilities to perform a behaviour (Bandura, 1986). Compared with self-efficacy, perceived internal behavioural control focuses on the individual's own ability to perform a behaviour.

In this vein, external perceived behavioural control is defined as individual judgments relating to the availability of resources and environments to perform a behaviour (Ajzen, 1991; Hsu et al., 2004). In the study of knowledge-sharing, scholars have identified that perceived behavioural control was a significant predictor of intent to share knowledge (Husted et al., 2002). Ryu et al. (2003) further found that perceived behavioural control influences the intentions of physicians to share their knowledge. Kuo and Young (2008) also state that perceived behavioural control precedes the intention to share knowledge. This research considers the conditions and facilitating resources as external controls of behaviour at the institutional level. In the next section, a synthesis of Institutional Theory and the TPB is presented.

3.4 The Synthesis

Based on Institutional Theory and the TPB, this research proposes a conceptual model for investigating the ways in which both institutional and individual behaviour influence decision-making in the context of IT governance. The behavioural aspect

of decision-making can be understood through the lens of seeking organisational legitimacy and by considering institutions' individual motivation. Institutional Theory (Scott, 2001) provides significant insight into the importance of institutional settings, including institutional rules, norms, and culture, on the actions (behaviour) of individuals (Tolbert et al., 1983; Tolbert, 1985). In contrast, the Theory of Planned Behaviour provides insights into the ways in which individuals' attitudes, subjective norms, and control influence their behaviour regarding action intention (Ajzen, 1991).

3.4.1 Institutional Perspective

The conceptual model for this research is based on various ideas about institutional theory (Scott, 2001). According to Scott (2001), institutions' beliefs relating to individuals and their non-rational behaviours are postulated regarding the institutional impacts on behaviour. Individuals' behaviours are embedded in institutional settings, which provide people with a basis for actions and behaviours (Powell, 1991; Thornton et al., 2008). Single actors consider various institutional impacts when interpreting what actions are available to them, allowing them to make their decisions (Lawrence et al., 2011).

Returning to Scott (2001), there are three pillars inherent in institutional theory, which posit that there are three types of institutional pressure that influence behaviour: regulatory, policy and cultural-cognitive. Importantly, such institutional pressures provide guidelines and limit actions (Scott, 2001). Regulatory pressure provides organisations or individuals with coercive limitations and legal sanctions for not complying. Regulatory pressure refers to the social obligation caused by the common expectations within and across a community. Set standards share regulatory pressure in adapting behaviours. Training, education and associations

teach individuals shared norms, and individuals are morally governed by such collective expectations.

Finally, cognitive-cultural pressure refers to the shared understanding of the world, and how this is taken for granted. The cultural-cognitive institution is deeply embedded in communities, with dependence on social domains. Organisations or individuals observe the activities of others, and simply imitate their behaviour. These three pillars map the institutional pressure on individual decision-making behaviours in the context of research communities.

First, institutions have regulatory pressures applied in such a way as to encourage desired behaviours. As a key resource, organisations and funding agencies that support research decision-making can create regulatory pressures as a condition of funding. Also, journal editors exercise regulatory pressures on writers of decision-making papers through their editorial policies.

Secondly, decision-making disciplines and professions may have their social expectations, which might encourage or discourage decision-making. Social expectations, based on shared norms in making decisions within communities, provide decision-making in such communities, along with regulatory pressures to take decisions. Decision-making communities can hold collective expectations regarding decision-making based on shared standards, with pressure towards shared decisions based on collective desires. Indeed, as institutional and disciplinary pressures on decision-making increase as a result of the increased take decision between colleagues within a decision-making community, individual researchers respond with consideration as to the merits of participating in the trend (Scott, 2001; Tolbert et al., 1983).

Finally, decision-making can take IT governance for granted as a part of the decision culture within communities. A shared understanding of IT governance within a cognitive science community provides cultural pressures for decision-making and mimics the approved practices and behaviours without individual cognitive processes. In this case, decision-making is deeply rooted in research communities as a constitutive scheme (Scott, 2001).

Traditional Institutional Theory has focused on regulatory, policy and cultural-cognitive pressures and legitimate organisational structures and practices in a given sector, as well as how this legitimacy tends to encourage organisational isomorphism within industries. However, this research is more concerned with how such pressures impact the behaviours of individuals in an institutional context. Institutional Theory, presented by Scott (2001), explains how the three pillars of institutions influence decision-making at the individual level from the perspective of legitimacy and isomorphism. Individual decision-making seeks legitimacy through the making of decisions under institutional pressures, but decision-making is also based on a person's motivations, stemming from their beliefs and perceptions. Along with institutional theory, the Theory of Planned Behaviour can help to explain individual decision-making and decision-sharing, based on the perceptions and motivations of behaviour.

3.4.2 Individual Perspective

The Theory of Reasoned Action and its successor, the Theory of Planned Behaviour, are well established social psychology theories describing the relationships between beliefs, behavioural intentions, and subsequent behaviour (Ajzen, 1991; Fishbein et al., 1975). The TPB explains the behaviours of individuals based on their behaviour intent, which is impacted by their attitude towards

behaviour, the perception of subjective norms regarding the behaviour, and perceived behavioural control.

Behaviour refers to the objective intention of a person to perform a certain behaviour (Ajzen, 1991), while attitude is a cognitive and emotional evaluation of an object or behaviour (Ajzen, 1991). The subjective norm relates to a person's belief that people who are important to the individual believe they should or should not perform a certain behaviour (Ajzen, 1991). The perceived control of behaviour is the perception of an individual's ability to perform a certain behaviour relatively easily (Ajzen, 1991). Each of the determinants of behavioural intention is impacted by the structures underlying certain beliefs, including behaviour, and rules which control these beliefs (Ajzen, 1991; Fishbein et al., 1975).

Using the TPB perspective, decision-making in the context of IT governance behaviour can be explained by the intentions of emerging behaviour: (1) attitudes formed from the beliefs and assessments of the 'findings' of behavioural decision-making; (2) understanding of subjective norms concerning the sharing of decisions from 'close colleagues' and their expectations; and (3) the perceived controllability of decision-making behaviours.

Importantly, attitudes towards decision-making influence intentions to share decisions. Behavioural beliefs about decision-making and individuals' assessments of the impact of decisions lead to attitudes concerning decision-making. Moreover, the subjective impact standards concerning decision-making affect intentions. Subjective norms in the Theory of Planned Behaviour are seen to be comparable with the regulatory pressures regarding the Institutional Theory concept. In contrast with regulatory pressure, which comes from other decision-making in their fields

(Meyer et al., 1977; Scott, 2001), subjective norms come from 'close colleagues' in the individual's interpersonal social network.

Finally, Perceived Behavioural Control (PBC) impacts decision-making in the context of IT governance behaviour. Decision-making can form perceived behavioural controls, both internally and externally. Internal construction is similar to what is proposed by Bandura (1986), i.e. the perception of one's own effectiveness, which reflects one's judgments and ability to enact behaviour successfully. With regard to decision-making behaviour, PBC can arise from decision-making knowledge (or lack thereof) in the use of the tools and technologies facilitating decision-making. External PBC is an individual judgment concerning the general availability of resources and opportunities to perform the behaviour (Hsu et al., 2004). Research has shown that the availability of IT support within a team or organisation, as well as the existence of decision-making protocols, procedures, and decision repositories, can all impact the likelihood that a person will participate in the take decision (Hsu et al., 2004).

3.4.3 Integrating Institutional and Individual Perspectives

This study combines Institutional Theory and the Theory of Planned Behaviour. When attempting to integrate two different theories, it is important to understand the assumptions underlying each, along with the values to be incorporated into the suggested model.

The main assumption behind TPB is that individuals make rational and reasonable decisions based on their attitudes, subjective norms and perceived behavioural controls (Ajzen, 1991; Fishbein et al., 1975). However, the TPB makes the

assumption that the rationality of individuals does not mean that all behaviours are necessarily rational from an objective point of view (Contento, 2011).

The main assumption underpinning Institutional Theory is that social actors respond to institutional impacts to conform (DiMaggio et al., 1983; Scott, 1995, Scott, 2014). Institutional Theory rejects the assumption that social actors rationally seek to maximise efficiency and productivity (DiMaggio et al., 1983; Scott, 1995). In other words, it assumes that individual actors do not perform their behaviour based on 'pure' rationality, pursuing acceptable performance to legitimise their behaviour with rationality in an institutional context (Budros, 2002). Therefore, the integration of Institutional Theory and the Theory of Planned Behaviour can provide a complementary view of behavioural intention regarding decision-making, focusing on compliance with the legitimacy of individual motivations and behaviour.

Previous studies have combined Institutional Theory and individual-level theories to understand the behaviours of individuals. For example, Kim (2013) linked Institutional theory with theory of planned behaviour to investigate the dimensions impacting scientists' data sharing behaviours in diverse scientific disciplines; Shi, Shambare and Wang (2008) connected Institutional Theory and the Theory of Reasoned Action (Ajzen, 1991; Fishbein, 1980; Fishbein et al., 1975) in an effort to examine the adoption of internet banking. Similarly, Teo Wei and Benbasat (2003), and Son and Benbasat (2007) used Institutional Theory to examine senior executives' and senior managers' intentions to adopt inter-systems, and introduced the concept of intention, whilst Ajzen and Fishbein's (1980) model offers an extensive map of decision-making in relation to decision behaviours, and shows how decision-making is carried out through one's decisions. Importantly, this conceptual enterprise resource model considers the major underlying supporting infrastructure for decision-making in the context of IT governance behaviours.

3.5 The Conceptual Framework

Table 3.1 presents an outline of this study, supported by two analysis levels of decision-making in the ITG context: the institutional level (institutional theory) and the individual level (TPB). It is based on theoretical framework models for the deployment of ITG in public sector organisations. This proposed conceptual framework will guide the study and offer valuable contributions to the literature on methodologies related to the adoption and deployment of innovations.

Research Questions	**Level of Analysis**	**Sources**
Q1: What kinds of institutional dimensions impact the decision-making processes concerning ITG adoption, and how?	Institutional Level	Semi-structured interviews, gray literature, observations, documentary data, websites of PSO
Q2: What kind of individual dimensions impact decision-making related to ITG adoption, and how?	Individual Level	
Q3: How do the institutional and individual dimensions impact decision-making for ITG adoption in PSOs?	Individual and Institutional Levels	

Table 3.1 Outline of this study

The model for this research is based on ideas proposed in institutional theory (Scott, 2001), which posits that there are three types of institutional pressure that impact behaviour: regulative, normative and cultural–cognitive. Regulatory pressures impose legal restrictions on organisations or individuals and enforce sanctions for failures to comply. The pressures are shared standards for the suitability of

organisations' or individuals' behaviours. Finally, cultural–cognitive pressures are deeply rooted in communities and have to do with whether an organisation or individual is considered culturally compatible. These three institutional pressures determine decision-making regarding individual behaviours in the context of research communities. Moreover, in connection to institutional theory, the conceptual model used in this research also employs Ajzen's (1991) TPB, or theory of individual motivation. The TPB provides detailed information about an individual's attitudes, subjective norms and perceived behavioural controls, which are seen to impact behaviour and to be mediated by intention. Along with institutional theory, the TPB can explain how individual decision-making leads to the making of decisions based on individuals' motivations.

Figure 3.1 presents the conceptual framework used in this research for the adoption of ITG in public-sector organisations, on both the institutional and individual levels. The framework highlights the interrelationship between these two levels for ITG adoption and use. The institutional level and individual levels, as shown in figure 3.1, are a set of dimensions referred to in previous studies that impacts ITG adoption. The interrelationship between institutional and individual dimensions will help to fully understand these dimensions for ITG adoption and will help discover other dimensions in both levels through the Research Model of IT Governance Adoption in Public-Sector Organisations.

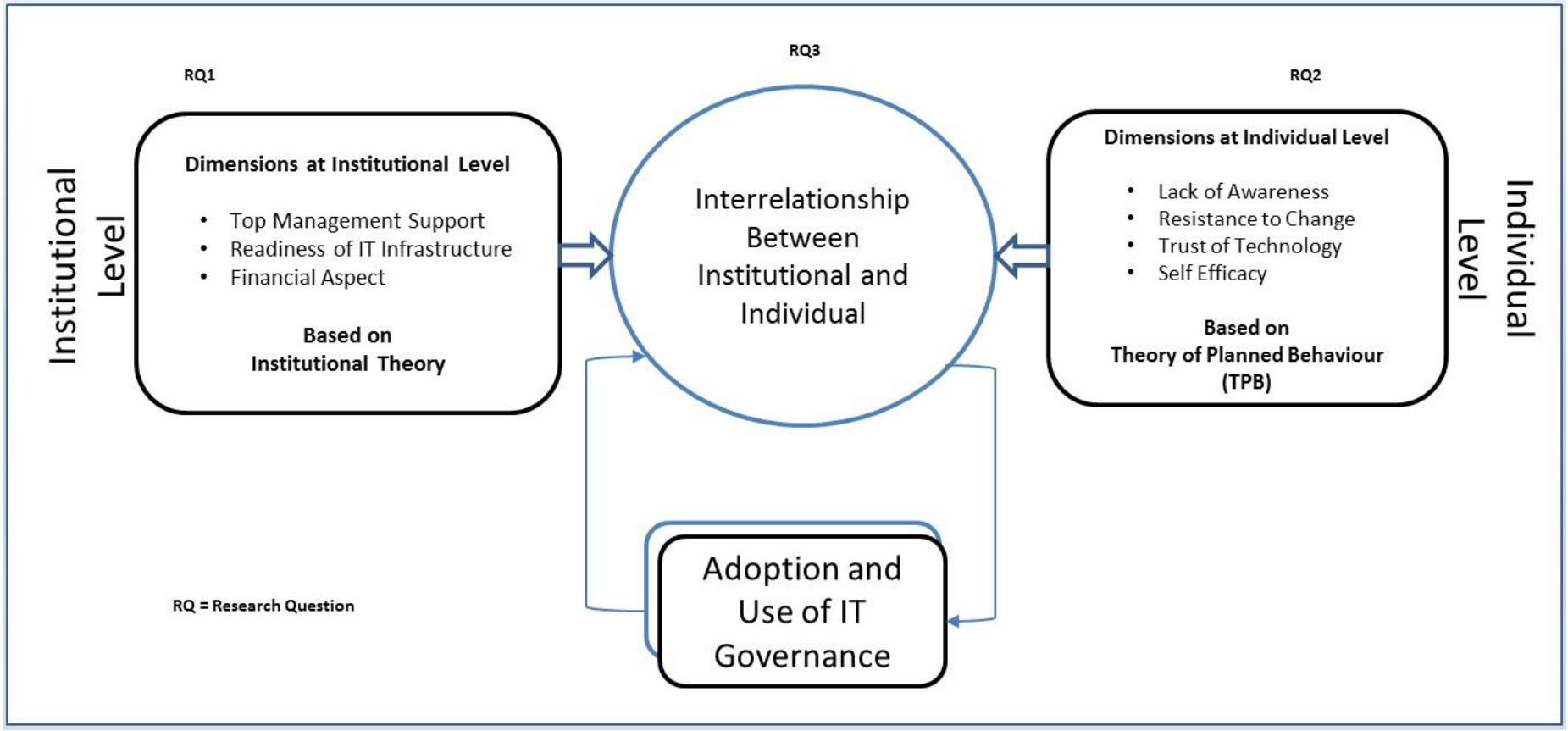

Figure 3.1 The Conceptual Framework

3.6 Chapter Conclusion

This chapter has analysed the theories in the area under investigation to help in building a conceptual framework based on theories which fit this study. The integration of theories in this study will contribute to the exploration of the key impacts of decision-making in the public sector regarding the adoption of ITG. Institutional Theory and the TPB will be the main points of reference for this exploratory study, which will be used to propose a model that combines both institutional and individual perspectives to explain how individuals make their decisions under institutional influences.

Chapter 4: **Methodology**

4.1 Introduction

This chapter describes the method for the study, which is an interpretive qualitative study that uses semi-structured interviews in the context of public sector organisations to understand the dimensions that might impact the adoption of ITG. The study involved gathering data from IT directors in different government organisations who had experiences that could help to clarify the nature of the study problem and who had responsibilities related to the adoption of ITG in the public sector. The thematic analysis method was employed to identify themes within the data using coding techniques. Table 4.1 presents an outline of the study methodology used to collect the data and produce the study findings:

Level of decision	Choice
Research Philosophy	Interpretive
Research Approach	Qualitative Inquiry – mostly inductive
Research Strategy	Investigating the issue through probing and analysing the phenomena
Research tool	In-depth interview
Research Analyses	Thematic Analysis
Research Theories	Institutional Theory, Theory of Planned Behaviour
Context	OMAN, Public Sector Organisations
Sample	(32) IT Directors; (32) Government Organisations

Table 4.1 Brief Outline of Research Methodology

4.2 Research Philosophy

It is critical to consider the philosophy underpinning this research, since the research philosophy directs the gathering, interpretation and narration of data. In the field of social research, there are two key paradigms: phenomenology and positivism. The latter approach has been widely implemented among natural scientists and social scientists since the late 19th century. Positivism focuses on examining the causes or facts of social phenomena in an objective, precise and rigourous manner (Collis & Hussey, 2003). Positivists believe that human behaviour studies should be similar to those carried out in the natural sciences and social reality is continuous, always present and independent of contexts and human involvement. However, that further triggers the ontological debate questioning what constitutes reality, which differs from the epistemological question of how knowledge pertaining to reality can be gathered.

Despite its widespread use, the positivist approach has received significant criticism for a number of reasons; including its lack of flexibility and the fact that the processes to which people attach action cannot be effectively captured (Guba & Lincoln, 1994; Esterby-Smith et al., 2008). The ontological assumption underpinning positivism has also been criticised. For example, positivistic philosophy offers very little attention to the detail nature of a phenomenon, and its in-depth analysis from the researcher's perspectives; this can contribute to the development of a priory assumptions and understanding and facilitate the data collection and analysis. Such drawbacks mean that, in relation to the present work, the aim of which is to establish how human actors interact with technologies and to identify the most beneficial economic and emotional outcomes, the positivistic approach holds limited usefulness. People's viewpoints with regard to the benefits of ITG are, by nature,

subjective. Furthermore, the researcher's judgements and observations of the cultural and social study contexts are also valuable for developing further understanding and insight.

By contrast, phenomenology posits that, in social science, it is impossible to ensure a separation between the investigator and what is being investigated. In this vein, Miles and Huberman (1994) stated that phenomenology is a category of interpretivism, since both focus on the application of qualitative methods. They classify qualitative research into three distinct categories: collaborative research, interpretivism research and social anthropology research. Unlike positivism, which assumes a single reality, interpretivism assumes that there exist a number of different realities. This paradigm views social reality as inherent within human beings. Interpretivist works emphasise the subjective elements of human activities by directing emphasis towards the meanings of social phenomena rather than their measurement. Accordingly, interpretivist studies consider contexts and direct this contextual understanding towards the interpretation of data.

It is often difficult to clarify and explain how cultural, spatial and social elements interact with human and technological agents to develop a dynamic process of appropriation through lab-based experiments or survey-based statistical instruments; in such cases, deeper insights may be obtained from a researcher's direct observations of a process. A number of societies may use a single technology in different ways, and the resulting complicated and recursive links among human actors, society and technology are potentially better captured with qualitative approaches. In the establishment and description of such socially constructed phenomena, the researcher's role is a fundamental determining factor. Accordingly, there is a need for a researcher to interact with participants in order to gain insight into their opinions, perceptions and viewpoints. Data interpretation should also

consider contextual understanding. Accordingly, the positivistic approach may not be considered suitable for such a work.

Since an interpretivist methodology requires the active involvement and participation of researchers, it depends on the application of qualitative tools. Peshkin (1993) outlines several relevant research objectives that can be effectively addressed and satisfied by qualitative methods. The present work seeks to establish both description and interpretation and also seeks to develop an understanding of the present and possible links among different actors. Accordingly, this study's findings are of a descriptive nature. When describing theories and establishing new theories and concepts, insight into behavioural changes can involve development, as highlighted by Peshkin (1993), who believed such insights to contribute to *interpretation*, which can also be captured through qualitative methods.

The qualitative research makes no claim to objectivity, and the researcher is accepted as a participant observer or an observant participant (Myers, 2009). Yin (2009) stated that core research questions utilise words such as 'how' or 'what', which are best addressed by qualitative rather than quantitative methods. Furthermore, qualitative research works well within research environments that require some exploration (Creswell, 1998) or where the research agenda is nascent and there are limited comparable pieces of research. Qualitative research is also suitable when the focus is one in-depth study, rather than a more abstract piece of research (Dyer & Wilkins, 1991).

According to Punch (2013), the choice of research approaches depends on the problem defined in the research. Thus, the quantitative approach in not suitable for this research, as it aims to investigate, examine and analyse the dimensions that impact ITG adoption in the public sector, making it more subjective than objective.

This research's findings will also be more qualitative and not quantitative, using words and not numerical indicators (statistics) as in a quantitative approach. The research problem appears more clearly after collecting information and understanding the subject, and the qualitative sample size is smaller than a quantitative research sample; furthermore, the data in a qualitative approach is not statistically processed but classified and organised in themes or patterns to create a narrative synthesis.

Both qualitative and interpretivist research approaches have provided a wealth of value in the domains of consumer research (e.g., Agafonoff, 2006; Andrews & Boyle, 2008; Hogg & McLaren, 2008) and information systems (e.g., Suchman *et al*., 1999; Kawalek & Jayaratna, 2003; Mansourian, 2006), which are the two key academic disciplines associated with this research. Selecting this specific paradigm and method does not eradicate or disregard the importance and validity of others, which may have been more suitable had the study been carried out in other contexts.

With regard to data management, a template analysis was carried out. The transcripts were coded using the NVivo software package. The data analysis was first initiated with the development of a coding template, the identification and classification of themes and the identification of codes. This work also applied two more wide-ranging themes: namely, acculturation and dual cultural identity. Alongside these themes, two sets of codes were outlined. Although some of the codes were considered to be theory-focused, others were more focused on data, as has been recommended and implemented in a number of other academic works (Fereday & Muir-Cochrane, 2006; Chen et al., 2011). Once the data associated with the research objectives were established, they were examined using a constant comparative method (Rocca et al., 2014). The emergent themes were then compared to the extant literature.

This research studies the current situation of government organisations in a developing country looking to adopt ITG in an attempt to identify the current challenges and potential impacts of ITG adoption in the Omani public sector. It is hoped that the findings of this research will support the development of a model that can be used in government organisations.

4.3 Research strategy

For this particular study, the interpretive research strategy is considered to be the most appropriate for the constructivist philosophy. The assumptions of interpretive research suggest that knowledge can be garnered through human creations, as noted by Klein and Myers (2001). Moreover, the interpretive approach adopts the stance that social science studies should highlight people's individuality and should further emphasise the personal meaning of social actions (Bryman, 2008). Examining Participants conveniently lends itself to the idea underpinning social science, which pertains to dealing with people's actions in consideration of the interpretive approach.

Klein and Myers (2001) categorise interpretive research into different types, which are further grouped into two distinct areas: firstly, the general foundation of interpretive study, which is known to comprise philosophical foundations, methods and theories; and secondly, the adoption of interpretive studies in line with information systems. This study seeks to provide a contribution in regard to the second group through the application of interpretive research to an information systems phenomenon, utilizing the former to garner insight into the philosophical background of the study and the social phenomena under investigation. As a result,

the empirical investigations in this study will adopt an interpretive mindset in the hope of providing a valuable contribution.

Interpretive research encompasses various methods and research methodologies. In this vein, the work of Gray (2009) can be cited: Table 4.2 details the possible approaches that may apply to interpretive studies.

Interpretive Approaches	**Essential Elements of this Approach**	**Associated Research Methodologies**
Symbolic Interactionism	• Human interaction through meaning-making and interpretation. • Meaning arises through social interaction. • Meaning is revised based on experience. • Change in an individual's perception changes the meaning he or she assigns to objects and hence also changes the individual's behaviour.	• Ethnography • Participant observation methods • Grounded Theory
Phenomenology Research	• People's experience of their social reality will help the researcher. • Draws on subjective experiences. • Eliminates bias through eliminating preconceptions. • Sees the value of the researcher's and the subjects' interpretations.	• Interviews • Small samples • In-depth studies • Longitudinal studies • Qualitative methods
Realism	• Takes a scientific position in which research on topics such as culture and organisation exist independently of the researcher. • Systematic analysis	

	• There are phenomena that cannot be observed but still do exist. • Some 'facts' are mere illusions. • There is an observable reality that exists, but it is difficult to observe sometimes.	
Hermeneutics	• Social reality is socially constructed, but it is not an observable fact. • Social reality is difficult to understand through observation. • Interpretation is more important than explanation or description.	
Naturalistic Inquiry	• There are multiple constructed realities. • The inquiry is value bound to the researcher. • The inquiry is not generalizable, but specific a case.	• Interviews • Participant observation • Document and content analysis

Table 4.2 Interpretive Research adapted by Gray (2009)

The phenomenological approach appears to be the most suitable for this study, since it highlights descriptions, interpretations and subjectivity, and considers people's attitudes, beliefs and emotions (Denscombe, 2008), in addition to the various experiences of their social realities (Gray, 2009). Research styles commonly not included in scientific inquiry are covered in this approach, even those without emphasis on statistics and measurements (Denscombe, 2008). Essentially, it seeks to garner insight into a deeper understanding of the way in which individuals make sense of their surrounding environments (Bryman, 2008) through the application of

various qualitative techniques. Table 4.3 provides a summary of the characteristics of interpretive research according to Cantrell (2001).

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Feature	Description
Purpose of research	- Understand and interpret institutional and individual perspectives on the dimensions that could impact the adoption of IT governance in the public sector. - Find out the integration of institutional and individual perspectives (Multi-levels). - Discover potential relationships.
Ontology	- There are multiple realities. - Reality can be explored and constructed through human interactions and meaningful actions. - Discover how people make sense of their social worlds in the natural setting by interacting with others around

	them. - Many social realities exist due to varying human experience, including people's knowledge, views, interpretations and experiences.
Epistemology	- Events are understood through the mental processes of interpretation, which is impacted by interaction with social contexts. - Those active in the research process socially construct knowledge by experiencing real life or natural settings. - Inquirer and the inquired-into are interlocked in an interactive process - More personal, interactive mode of data collection.
Methodology	- Processes of data collected by interviews, documents and observation. - Research is a product of the values of the researcher.

Table 4.3 The Characteristics of Interpretive Research (Cantrell, 2001)

4.4 Research Methods

The research methodology adopted in the present work is phenomenological in nature, with an emphasis on inductive knowledge (Gray, 2009), which in this case involves the propensity to identify the descriptions and experiences of individuals in their natural environment and consequently to develop generalizations concerning these phenomena.

The use of different sources of data ensures that the research is significant in its interpretation, thus enabling positivist notions of triangulation to be identifiable in the course of the work. Also, methods applying a phenomenological approach focus on gathering explanations and rich data as opposed to examination, thus assigning attention to life's more mundane aspects.

In some instances, this also could include examining routine elements of life; at the same time, however, this assists in establishing an accurate understanding of participants' experiences, which are at the core of this study. Regarding analysis and examination, although phenomenological methods do not provide any subsequent approaches to analysis, it is possible to choose suitable methods of analysis following the collection of data.

As explained in the study framework, the interpretive and phenomenological approach makes use of qualitative research methods. The adoption of qualitative data through consideration of documentation, interviews, and participatory observations is applied in the current work. The interview method is commonly adopted, as it is almost exclusively compatible with a phenomenological stance. This study further utilises this approach through the completion of different qualitative research interviews, dependent on the participants under investigation, in addition to

in-depth interviews that are concerned with garnering rich information. In this study, qualitative research is recognised as the most valuable approach, due to its ability to establish insight into a social phenomenon (Myers, 1997). Figure 4.1 shows the research design of this study

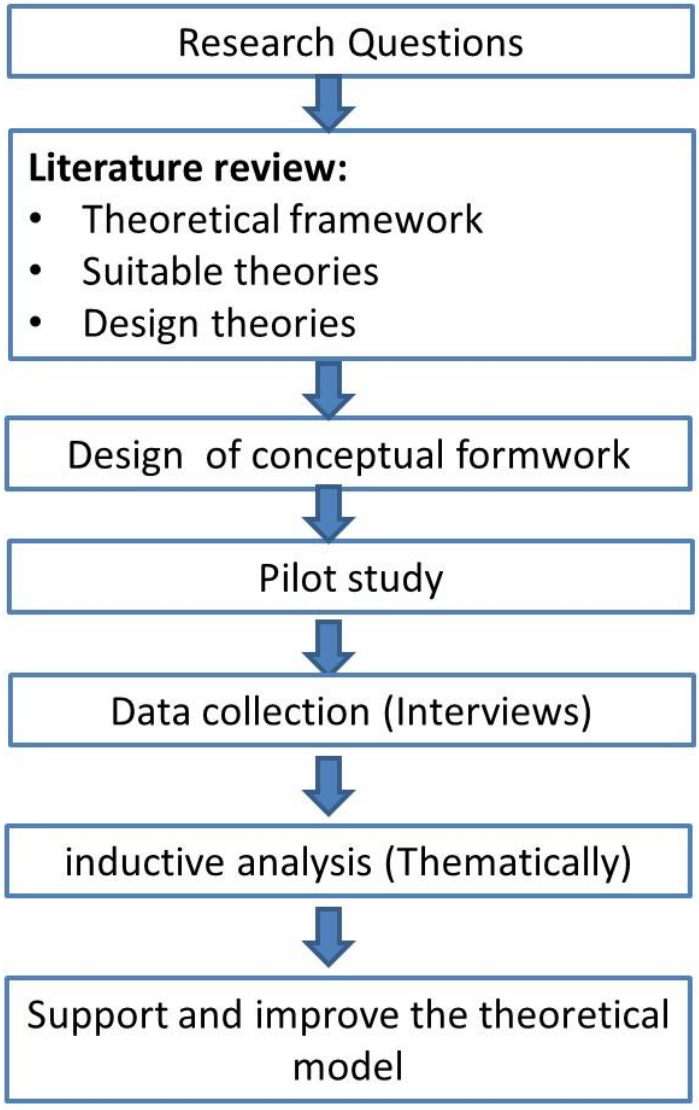

Figure 4.1 Research Design

4.5 Justification of the Interview Method

To answer the research questions, this study applied the interview method, which allows the gathering of deep information about a phenomenon. The researcher posed a series of questions to be answered by the respondents.

Table 4.4 presents evidence supporting the choice of the interview method for this qualitative study.

Evidence	Sources
"A specific form of a conversation where knowledge is produced through the interaction between an interviewer and the interviewee".	Kvale (2007)
"Interview method as consisting of interview meaning an interchange of opinion between two persons conversing about a theme of mutual interest."	Kvale and Brinkman (2009)
"…the interview method could be used as either a process of knowledge collection or as a process of knowledge construction. It is emphasised that it is the former and not the latter which this study aimed to achieve by using the interview method."	Kvale and Brinkman (2009)
"Qualitative interviews also allow the interviewer to focus the interview on particular themes which relate to the phenomenon being investigated."	
"Qualitative research interviews enable the researcher to cover both a factual and a meaning level, resulting in the researcher gaining not only explicit descriptions of events and activities from the interviewee but also being able to	Easterby-Smith et al., 2012; Saunders et al., 2012; Kvale and

pursue meanings about such incidents/activities so that an in-depth understanding of the phenomena being investigated is obtained."	Brinkman, 2009
"Advises the use of in-depth interviews to investigate complex systems, processes or experiences."	Ritchie et al., (2011).

Table 4.4 Justification for Applying an Interview Method

The justifications above suggest that the choice of an appropriate approach depends on the nature of the phenomenon to be studied (DiCicco-Bloom & Crabtree, 2006; Myers & Newman, 2007; Schultze & Avital, 2011). This study aims to investigate the dimensions that impact the decision to adopt ITG in the public sector; thus, it is important to closely consider the perceptions of opinions of specialists and to build positive interactions between the researcher and the participants to allow the researcher to interpret the participants' behaviours in relation to the studied phenomenon. For these reasons, qualitative research interviews are appropriate for deriving factual findings from a relevant sample.

4.6 Pilot qualitative study

A pilot study was designed to test the research questions and ensure their suitability. The interview questions were presented to specialists and academics to ensure their appropriateness for achieving the goals of the research (Rowley, 2012). Pilot interviews were then conducted with two IT directors in two different government organisations in Oman to establish the time needed for the interviews and to manage the ease and flexibility of the interviews. Some questions were amended as a result of this pilot study. The pilot study also provided knowledge that supported the effective management of the interviews, particularly with regard to avoiding

prolixity and repetition. Moreover, care was taken to ensure that the questioning did not lead participants towards biases rooted in specific dimensions obtained from the previous literature.

4.7 Data collection:

The data collection was conducted via 32 face-to-face semi-structured interviews with IT managers in public sector organisations in Oman. All interviews were recorded, and most were conducted in the Arabic language, since this is the native language of Oman. IT directors were selected for the interviews because these individuals are specialists in IT adoption and are responsible for the adoption of special initiatives. In addition to agreeing to the interviews, the participating IT managers offers access to their organisations' documents and information on their IT strategic plans, organisational structures and websites. They also gave the researcher the opportunity to observe the systems and their uses and to take notes on the differences between organisations (e.g. with respect to readiness and technology use). The (**appendix E**) shows list of interviews questions.

4.7.1 Sampling Strategies

According to Wilmot (2005), the process of selecting a research sample is one of the key elements in any research design. Prior studies confirm the importance of choosing an appropriate strategy in affecting the quality of the research (Marshall, 1996; Cresswell, 1998; Wilmot, 2005) and the strength and objectivity of the findings. The relevant sampling literature (Bryman, 2012; Denzin and Lincoln, 2000) suggests different tools and techniques in this regard, including homogeneous sampling; typical case sampling; extreme case sampling; critical case sampling; total

population sampling; maximum variation sampling; and expert sampling. This thesis applies maximum variation sampling to assess the responses of a wide variety of respodents in the public sector organsiations of Oman. The attention was paid to different levels in the management (although they are at director level, they have differences in terms of experience and managerial capacities) hierarchy and different types/departments in the public sector. The participants in this research were IT directors involved with the adoption of technology in public sector organisations. They had experience concerning the nature of decision-making in the adoption of technology and, especially, the adoption of ITG; thus, their insights offer new knowledge and perspectives on the adoption of ITG in different government agencies.

The sample selection aimed to recruit the largest possible number of IT directors in the public sector in order to collect as many different perspectives and opinions as possible. The researcher interviewed 32 IT directors from 32 government organisations (one director from each organisation). The total number of government institutions and agencies in Oman is approximately forty-two (NCSI, 2014).

Table (4.5) below shows the three types of government bodies from which data were collected through interviews with IT directors in the Omani public sector.

Public sector organisations	No.
Government Ministries	20
Government Authorities and institutions	8
Government Councils	4
Total	**32**

Table 4.5 Types of the public sector organisations

4.7.2 Semi-Structured Interviews

Semi-structured interviews have one key advantage: They allow the researcher to pose open-ended questions in order to gather in-depth data from the interviewees. This is essential across all stages of the current work, especially since this research aims to collect relevant information from government organisations in the exploratory phase.

Confidentiality and anonymity play a critical role in the business environments of the government organisations under investigation. Interviewing helps to eradicate some of the limitations associated with researching such a context. For example, due to confidentiality concerns, some high-level interviewees may be uncomfortable writing down responses or being cited, but may be more open to voicing their opinions anonymously. Furthermore, as a direct result of the busy organisational setting of government organisations, time restrictions can sometimes make face-to-face interviews more feasible and appropriate for evaluating a situation and accordingly

asking relevant questions within a short timeframe (Myers and Newman, 2007; Schultze and Avital, 2011).

The semi-structured interviews were carried out for the purpose of interpretive empirical inquiry. This approach focuses on analysing participants' experiences, sometimes through follow-up questions and further validation steps (as needed). Accordingly, semi-structured interview methods were considered most suitable for the present research because they delve deeper than structured interviews. This is an essential characteristic when investigating the subjective meanings associated with phenomenological studies (Gray, 2009).

4.7.3 Observations

The goal of the qualitative observations in the current work is to offer a direct approach to research in the social field. Qualitative observations do not provide details on what people think, say or do; rather, they provide first-hand eye-witness accounts of a studied situation (Denscombe, 2008).

For the present study, it was necessary to take notes concerning the research observations relevant to the study question; therefore, note-taking was adopted as a complementary approach for gathering understanding (Mays & Pope, 1995). This would be problematic if the interviews were conducted without the use of any other technique. Observations might provide additional opportunities to probe and ask questions where necessary.

4.7.4 Document Analysis and Websites

A crucial step in this research is the systematic assessment or evaluation of organisations' documents detailing their strategies and structures. This is known as

document analysis, and it aims to support greater insight into and understanding of the study sample (Bowen, 2009).

Different sources of data are often required in research to ensure that the findings can be validated. This approach is fulfilled through the practice of triangulation (Bowen, 2009), which will be examined in more depth later in this chapter. In this study, triangulation is achieved through the simultaneous use of document analysis and other qualitative research methods (e.g. observations and interviews).

4.8 Data analysis method

Based on Myers' (2009) qualitative research design, data collection is followed by data analysis. This section will examine the analysis stage of this research. Miles and Huberman (1994) described data analysis as the process of reducing and displaying data and drawing conclusions. Data reduction is the process of simplifying and summarizing data. This is followed by efforts to conclude and explain the data and their relationships to the research question and the theoretical framework.

The literature describes various methods of qualitative analysis, such as grounded theory (Glaser, 1992; Strauss and Corbin, 1998), narrative analysis (Murray, 2003) and discourse analysis (Potter and Wetherell, 1987). In the present study, the data were analysed using thematic analysis. This method is "…widely used in qualitative research and is known as a means to identify, analyse, and models (themes) within the data - reporting" (Brown and Clark, 2006: 83).

According to Myers (2009: 175), "there is no such thing as one approach that is better than all others: each has advantages and disadvantages." For example,

when choosing an analytical method, Myers (2009) suggested that a researcher should consider whether he or she found the chosen approach interesting. Moreover, as described earlier, thematic analysis is widely used in qualitative research. Table 4.6 identifies some of the benefits of using thematic analysis on a large scale.

Advantages of Thematic Analysis
Accessible to researchers with little or no experience with qualitative research.
Can highlight similarities and differences across the data set.
Can usefully summarise the key features of a large body of data and offer a thick description of the data set be used in a specific analysis
Can be useful for producing qualitative analyses suited to informing policy development.
Relatively easy and quick method to learn and do.

Table 4.6 Advantages of thematic analysis (Braun and Clarke, 2006)

The guide to data analysis used in this research has six stages of thematic analysis, as described by Braun and Clark (2006) and presented in Table 4.7 below.

Stage	**Description of the Process**
1- Familiarising yourself with your data	Reading and rereading the data; noting down initial ideas
2- Generating initial codes	Coding interesting features of the data
3- Searching for themes	Collating codes into potential themes; gathering all data relevant to each potential theme
4- Reviewing themes	Checking that the themes work with the coded extracts

	(level 1) and the entire data set (level 2).
5- Defining and naming themes	Conducting on-going analyses to refine the specifics of each theme and the overall story the analysis tells; generating clear definitions and names for each theme
6- Producing the report	Selecting vivid, compelling extract examples; conducting the final analysis of selected extracts; relating the analysis back to the research question and the literature; producing the findings of the analysis

Table 4.7 The Stages of Thematic Analysis (Braun and Clarke, 2006)

There are two approaches to analysing research data: inductive and deductive. Deductive analyses draw categorisations from a theoretically derived/pre-defined set of themes. By contrast, inductive analyses generate categories and themes from the data (Pope et al., 2000; Joffe & Yardley, 2004). This study uses inductive analysis to determine new themes and subthemes in order to properly explore the phenomenon.

4.8.1 Inductive thematic Analysis

This study analyses its data using an inductive thematic analysis approach. According to Polit and Beck (2010), data analysis in qualitative research starts with the use of themes. Thematic analysis is used to identify, analyse and describe patterns or themes in the data in order to identify the various elements of the research topic. Braun and Clarke (2006) stated that themes are models that indicate important aspects of the data and present a certain level of response to the research question. The objectives of the investigation are the subjects of this study. In other words, the study uses both theoretical analysis and thematic non-inductive thematic analysis.

Thematic analysis differs from other data analysis techniques, such as phenomenological interpretative analysis and grounded theory, because of its interest in descriptions of models from data but within theory (Braun & Clarke, 2006). Thematic analysis organises and describes the search data based on themes. As Patton (1990) describes, in inductive thematic analysis, the identified issues are closely linked to the data. Theoretical thematic analysis is informed by a theoretical or analytical research interest in a given area (Braun & Clarke, 2006).

4.8.2 Process for data analysis

As stated above, this study used thematic analysis to analyse the data. The major steps used to analyze the data are set out below. (See section 4.9 for data anlysis and coding) :

1. The first step involved thorough reading of the 32 interview transcripts, and highlighting of transcripts that were linked to the building of the theoretical model. The researcher immersed himself in the findings by reviewing the

findings and the notes taken in each interview. This helped the researcher to gain more familiarity with the data.

2. The researcher then began to code some of the information from the highlighted text. This helped to retrieve various data easily from different texts.
3. The dimensions identified in the earlier stage were classified using symbols and data were categorised or subcategorised within the dimensions identified earlier or used to form a new category. New findings were then coded regarding the new law and classified into a new category (new theme). New dimensions that impact the adoption were determined.
4. Review of the themes with the category of the findings.
5. After that, the researcher went through each category (topic) to determine the subcategories. This process continued until it was not possible to subcategorise topics or group any further.
6. Finally, the findings were written up and their association with the question of research and literature was determined.

4.8.3 Data Analysis Tool

Computer-Assisted Qualitative Design Analysis Software (CAQDAS) was required for the qualitative data analysis, with the interviews being transcribed and subsequently uploaded to QSR NVivo 10 software to facilitate the coding, theming and efficient retrieval of the text (Bryman, 2008), thus enabling the relevant and comparable knowledge, facts and ideas to be brought together from across the IT directors' views. This required the transcripts to undergo thematic analysis, establishing the differences and similarities between the different interview accounts, thus facilitating a direct contrast against the framework's themes and elements, as

well as the theory underpinning the literature search, i.e. triangulation. Through such an approach, there was cross-checking of the findings, which ensured that any identifiable bias in the qualitative approach was eradicated, while simultaneously improving the overall validity and value of the findings (Bryman, 2008).

4.9 Data analysis in practice

As mentioned in the methodology chapter, most of the interviews were conducted in Arabic, which is the official language in Oman. All interviews were translated by a professional translator and all data transcripts were checked to ensure that they matched the original interviews to avoid any missing data.

Then, the transcripts of the thirty-two interviews were imported into the Nvivo V.10 software, which was used to create nodes for the coding of data. Thematic analysis was used as a tool for data management and classification of categories. Participants were coded from P1 (Participant No.1) to P32 (Participant No.32), as shown in Figure 4.2.

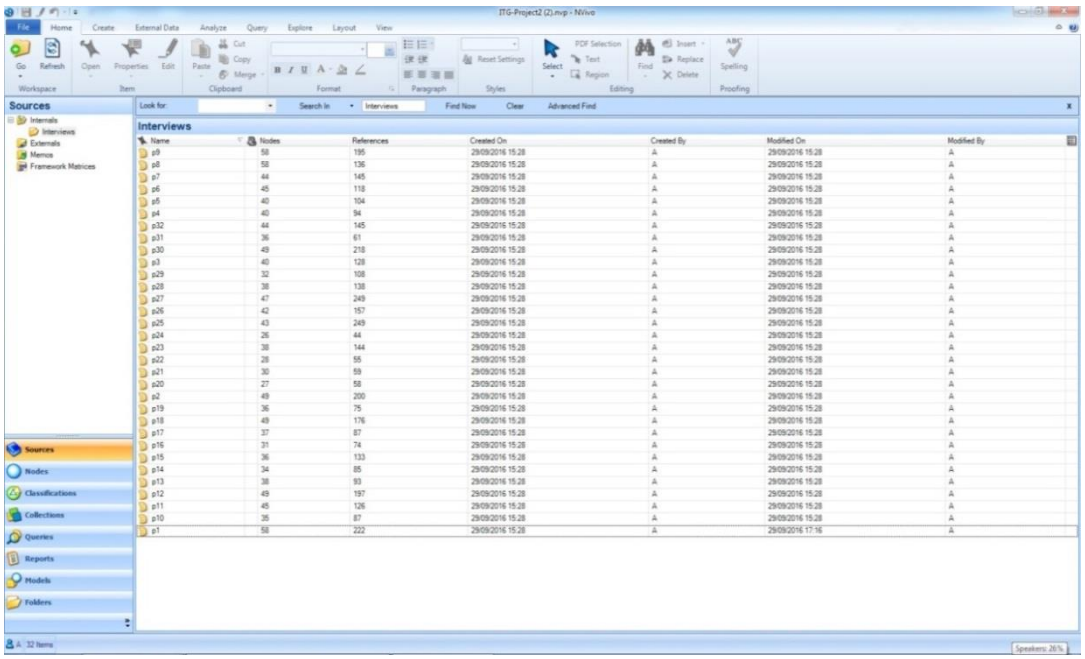

Figure 4.2 Coding of Participants in NVivo

4.9.1 The Coding Process:

According to Creswell (2009), the following analytical steps are suggested for data analysis (Table 4.8):

Preparing data for analysis
Translating the data into English and transcribing all interviews.
Classifying the documents of organisation, websites, observation and notes taken.
Preparing for coding by using mind map tools to code dimensions manually, then using Nvivo to organise and analyze them.
Reading through all the data
Reviewing all data from the participants to get an idea and plan through the information gained
Coding process
Conceptualise initial coding and sub-codes fitting the findings to derive new codes
Identifying themes/dimensions
Stating the procedures of the new discoveries by linking themes with different types of dimensions.
Interrelating themes/dimensions
Analytical work to discuss each of the dimensions and their interdependence, as

well as views on multiple themes
Interpreting the meanings
Making sense of the data, with reference to the literature for understanding and interpretation

Table 4.8 Analytical steps, adapted from Creswell (2009)

By using NVivo software as a qualitative analyses tool, all the imported interviews were analyzed for nodes. Around 108 nodes were found in the initial process. These nodes were classified into groups, as shown in Figure 4.3, below, which shows all nodes derived by NVivo tools.

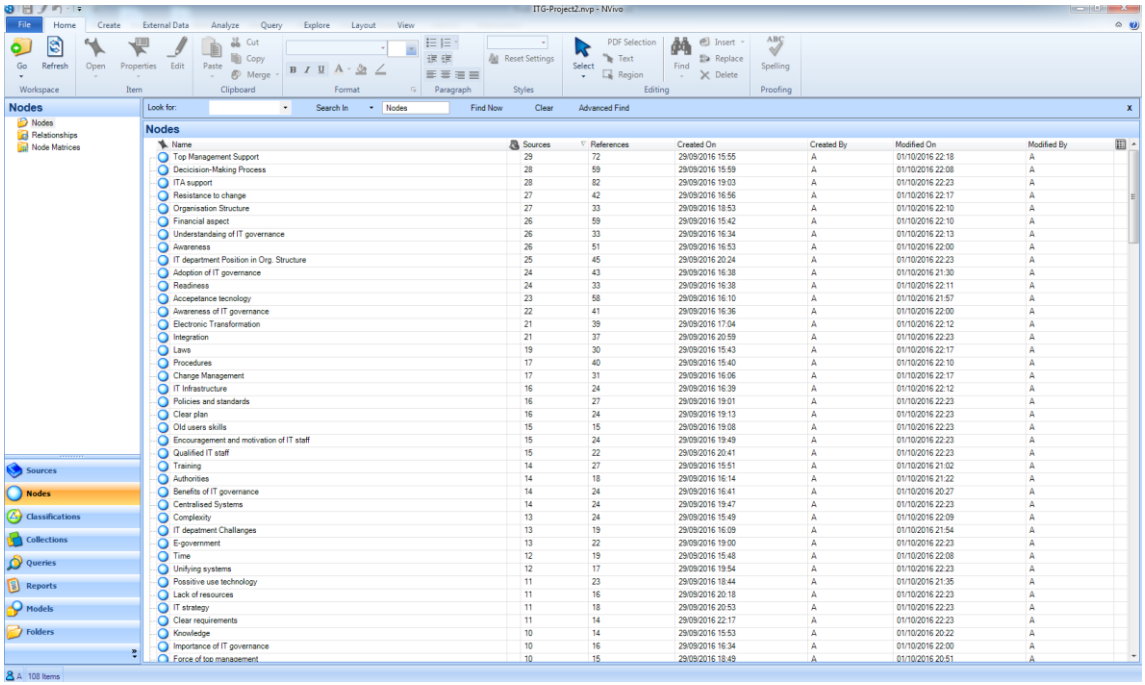

Figure 4.3 Nodes by NVivo

Table 4.9 lists all nodes by sources and references to allow ranking and identification of the key dimensions and frequencies.

No.	Name	Sources (%)	Sources	References
1	Top Management Support	91%	29	72
2	ITA support	88%	28	82
3	Decision-Making Process	88%	28	59
4	Resistance to change	84%	27	42
5	Organisation Structure	84%	27	33
6	Financial aspect	81%	26	59
7	Awareness	81%	26	51
8	Understanding of IT governance	81%	26	33
9	IT department's position in org. structure	78%	25	45
10	Adoption of IT governance	75%	24	43
11	Readiness	75%	24	33
12	Acceptance technology	72%	23	58
13	Awareness of IT governance	69%	22	41
14	Electronic Transformation	66%	21	39
15	Integration	66%	21	37
16	Laws	59%	19	30
17	Procedures	53%	17	40
18	Change Management	53%	17	31
19	Policies and standards	50%	16	27
20	IT Infrastructure	50%	16	24

21	Clear plan	50%	16	24
22	Encouragement and motivation of IT staff	47%	15	24
23	Qualified IT staff	47%	15	22
24	Old users skills	47%	15	15
25	Training	44%	14	27
26	Benefits of IT governance	44%	14	24
27	Centralised Systems	44%	14	24
28	Authorities	44%	14	18
29	Complexity	41%	13	24
30	E-government	41%	13	22
31	IT department Challenges	41%	13	19
32	Time	38%	12	19
33	Unifying systems	38%	12	17
34	Positive use of technology	34%	11	23
35	IT strategy	34%	11	18
36	Lack of resources	34%	11	16
37	Clear requirements	34%	11	14
38	Importance of IT governance	31%	10	16
39	Force of top management	31%	10	15
40	Duplicity at work	31%	10	15
41	Knowledge	31%	10	14
42	Intention	31%	10	13
43	Adoption of IT	28%	9	14
44	Experience	28%	9	12
45	Transparency	28%	9	12

46	IT challenges	28%	9	11
47	Comfortable with traditional paperwork	28%	9	10
48	The desire for change	25%	8	15
49	IT project team	25%	8	12
50	Collaboration between departments	25%	8	11
51	Individual Impacts	25%	8	10
52	The duality of use of technology	25%	8	10
53	Internet	25%	8	10
54	Clear requests	25%	8	10
55	Telecommunication Network	22%	7	12
56	Delays in IT project	22%	7	11
57	Relocations and resignations of IT team	22%	7	9
58	Understanding of IT	22%	7	9
59	Trust	19%	6	8
60	Education	19%	6	8
61	Young staff	19%	6	7
62	Efficiently	16%	5	6
63	Standardization of procedures	16%	5	6
64	Integrity	16%	5	6
65	Organisational Culture	16%	5	5
66	Unifying and Streamlining process	16%	5	5
67	Organisation Age	16%	5	5
68	Licenses for software	13%	4	7

69	Understanding of Management	13%	4	6
70	lack of understanding technology	13%	4	6
71	Outsourcing companies	13%	4	6
72	Tender Process	13%	4	5
73	Lack of labour	13%	4	5
74	Adaptation of technology	13%	4	5
75	Fear of adoption of technology	13%	4	4
76	IT investment	13%	4	4
77	Availability of specialists	9%	3	6
78	Misunderstanding	9%	3	5
79	Business continuity	9%	3	5
80	Management Problem	9%	3	4
81	Stakeholders	9%	3	4
82	Project Management	9%	3	4
83	Availability of Human Resources	9%	3	4
84	IT commission	9%	3	4
85	Failure of IT project	9%	3	3
86	Lack of project scope	9%	3	3
87	Lack of moral support	9%	3	3
88	Practice of IT	9%	3	3
89	Human resources	9%	3	3
90	Complexity of IT governance	6%	2	5
91	Organisation strategy	6%	2	3
92	Availability	6%	2	3
93	Challenge of integration with other organisations	6%	2	3

94	Feasibility of training	6%	2	3
95	Technical knowledge	6%	2	2
96	Flexibility of top management	6%	2	2
97	Organisation size	6%	2	2
98	Impact of leader	3%	1	2
99	Bureaucratic	3%	1	2
100	Partnership with the private sector	3%	1	2
101	Personality	3%	1	1
102	Directors changing jobs	3%	1	1
103	Dissatisfaction of E-government	3%	1	1
104	Changing of mind-sets	3%	1	1
105	Disaster recovery	3%	1	1
106	Insourcing	3%	1	1
107	Foreigners to IT	3%	1	1
108	Lifecycle of system	3%	1	1

Table 4.9 The ranking of nodes by NVivo

4.10 The Credibility of this Research

There are various dimensions to be taken into account that can potentially affect the credibility in the completion of social studies, such as the accuracy and overall objectivity of the research, suitable coverage regarding sample sizes, feasibility, relevance, generalizability and ethical considerations (Denscombe, 2008).

4.10.1 Objectivity—Interview Credibility

It is common for interviews to be considered as fabricated situations that are not true to real life, since answers are required under situations of pressure—such as in regard to time, intrusiveness and possible interference with the behaviours and beliefs of participants (Myers & Newman, 2007). Accordingly, when carrying out the interviews for this study, fairness was prioritised to eradicate any form of bias on the part of the interviewer; it is important to maintain proper interview etiquette, which was emphasised and highlighted during each interview. According to Myers and Newman (2007), there are seven guidelines (Figure 4.4) for qualitative research interviews, which help to resolve possible interview issues, ensuring preparation against such eventualities:

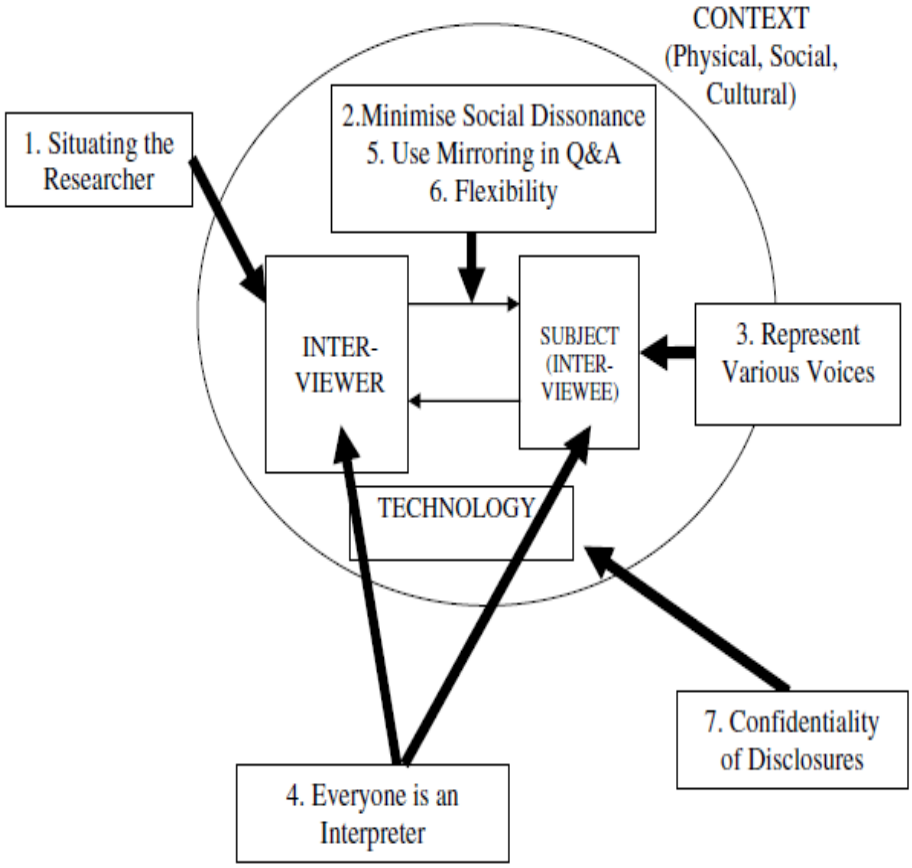

Figure 4.4 Guidelines for the Qualitative Research Interview Adapted by Myers and Newman's (2007)

1. *Situating the researcher:* The researcher provided a suitable introduction at the onset of each interview. The researcher's interest and background were discussed, along with the provision of a suitable letter and information detailing the interview schedule and the interviewer's credentials.
2. *Minimise social dissonance:* The researcher presented himself in a suitable way to the IT directors, to ensure that the interviewees were comfortable and aware of their rights when asked questions.

3. *Represent various voices:* This study emphasises the focus of various organisations as IT directors, with the collection of data highlighting this focus through interviewers to ensure that all views are taken into consideration.
4. Everyone is an interpreter: Care was taken to ensure that the interpretive stance of the study was recognised throughout.
5. *Mirroring:* Each interviewee's points of interest were detailed and followed up either immediately or in subsequent discussions. Key terms will be communicated by interviewees when asked the opening questions; such terms were then consciously used by the interviewer when posing questions (as and when appropriate).
6. *Flexibility:* Semi-structured interviews were conducted to provide the interviewer with the greatest possible opportunity to drive and elaborate on the discussion in line with the respondents' views.
7. *Confidentiality of disclosures and ethical approval:* Before the initiation of the interviews, a consent form was distributed, highlighting the preservation of privacy and anonymity when reporting the research. The views communicated by the interviewees were not assigned attributions, in order to respect all opinions and protect all identities.

As noted by Myers and Newman (2007), the application of guidelines such as these can act as a checklist, which can help to improve this valuable research tool for the collection of data. Moreover, it is essential to ensure that the interview questions highlight the research objectives. Drawing the questions from the research constructs shaped as a result of the literature review helped to ensure that this focus was maintained.

4.11 Interpretative Rigour

The provision of abundant, all-encompassing evidence is achieved through interpretative rigour, which may be ensured through the adoption of triangulation (Kitto, Chesters & Grbich, 2008). Triangulation is commonly utilised to tackle a research problem in the most comprehensive way (Morse, 1999), namely through collecting information from several different sources or otherwise through the use of multiple data-gathering tools (Denzin, 2005). This will enhance the validity and reliability of qualitative research (Golafshani, 2003), increasing readers' confidence in the findings (Thurmond, 2001). A number of different triangulation methods exist: this study will primarily focus on methodological triangulation, which can be used to strengthen and further reinforce the research, with various methods applied to collect data through means such as documentation, interviews, and observations. Despite the fact that triangulation is widely linked to a positivist research stance, it is used in the present study to guarantee good research practice, not as a way to achieve the position of a positivist research project.

4.12 Ethical Considerations

It is essential to obtain consent and permission from research subjects concerning the collection and use of data. Moreover, it is pivotal to ensure the ethical use of such data, especially due to the confidentiality concerns of individuals and organisations alike. The protection of privacy in regard to personal information and its processing is the main goal of the Data Protection Act of 1984 (Bott et al., 2001), which is a particularly relevant consideration when carrying out interviews. Confidentiality is also a critical concern that can be linked to maintaining a competitive edge in regard to both processes and products in government organisations. It is essential to demonstrate knowledge and diligence in this area, including the practice of using anonymity when distributing any of the study findings and conclusions.

This study has approval from Brunel University and the author was granted permission by his sponsor to access the government agencies (see Appendix A and Appendix C). Due to the nature of government institutions, all information about participants and organisations was secured. The participants all signed an informed consent form (see Appendix B). All the data collected were password-protected and saved in a safe place on the university portal.

4.13 Chapter Conclusion

This chapter has reviewed the methodology used for this study, data collection tools and the strategy for processing and managing the interview data. It has also outlined the process and methods used to uphold research ethics for this study. Figure 4.5 summarises the research process.

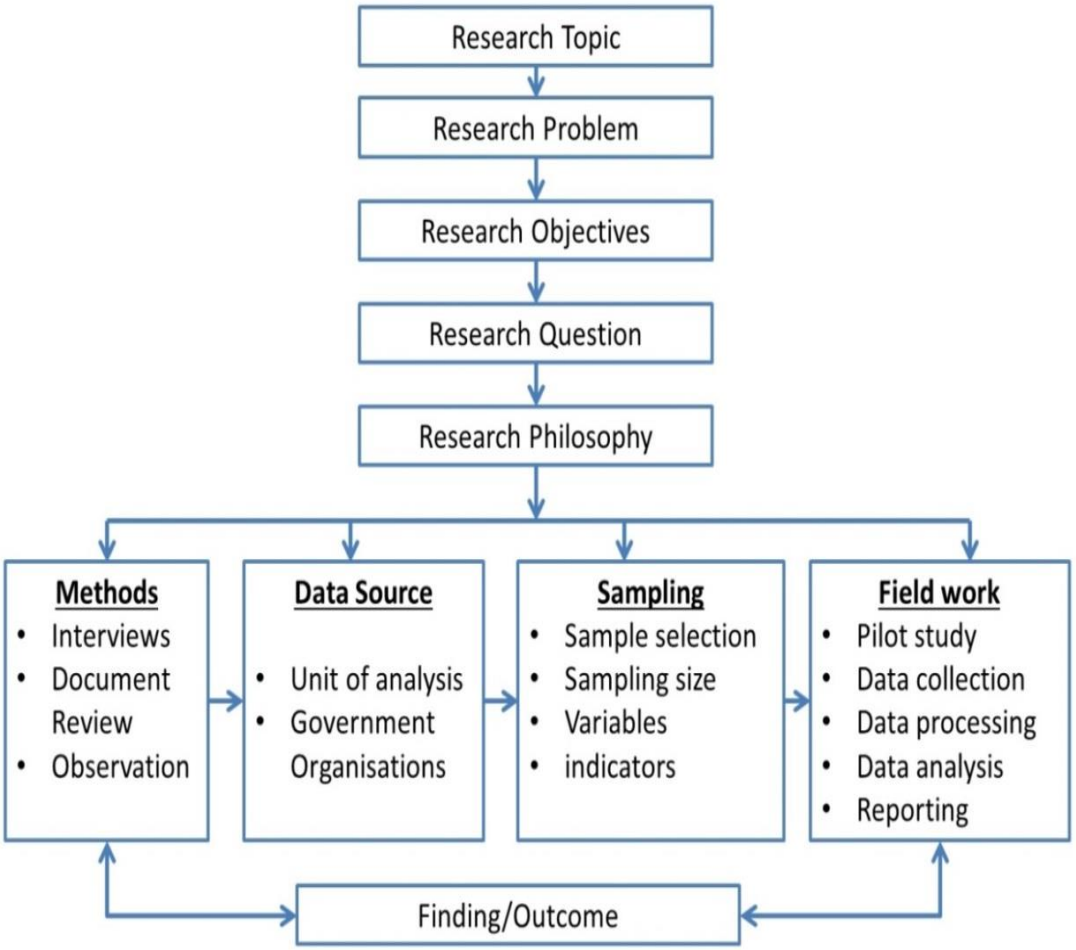

Figure 4.5 The Research Process

Chapter 5: **Analysis of the Findings**

5.1 Introduction

The aim of this chapter is to analyze the data gathered through interviews with thirty-two IT directors from public sector organisations in Oman to achieve the goals of this study. The findings from these interviews will be organised and coded, and will be briefly presented in relation to the main dimensions at the end of this chapter.

5.2 The Context of the Research

The aim of this study is to investigate the dimensions impacting the adoption of IT governance across Omani government organisations. The Sultanate of Oman is the context in which this study is conducted. As a developing state in the Gulf region, Oman has distinctive national, cultural and political characteristics. This study aims to determine the experiences of and practices concerning the adoption of IT governance in Oman to understand and define the issues surrounding such adoption in Omani government organisations.

5.2.1 Participant Demographics

The sample for this study comprised thirty-two IT directors from different government organisations in the Omani public sector. All interviews were conducted in public places and the identities of all organisations and participants were kept confidential.

The interviews were recorded after approval from participants. Participants signed a consent form for interviews. Table 5.1 provides a summary of the participants' demographics.

Characteristics	Participants (N=32)	Percentages (%)
Age		
20-30	1	3.1
30-40	18	56.3
40-50	11	34.4
50-60	2	6.3
Gender		
Female	4	12.5
Male	28	87.5
Experience		
05-10	7	21.9
10-20	14	43.8
20-30	10	31.3
30-40	1	3.1
Education		
PhD	1	3.1
MSc	9	28.1
BSc	21	65.6
Diploma	1	3.1
Total number of Participants = 32 (P1: P32)		

Table 5.1 Participant Demographics

5.3 Analysis of the impact of multilevel dimensions:

Mind map tools were used to organise the findings pertaining to dimensions from the NVivo analysis. Figure 5.1, below, shows the conclusion to the initial stage. This study divided its analysis into two perspectives: the institutional and the individual perspective. The analysis in this section depends on the frequency of participants' responses, which are probably highlighting the key dimensions. This dimensions most rely on other dimensions by combined as

a key diminution may impact each level of organisations and it included the set of dimensions referred to by the participants, which were important in helping to moderate different themes.

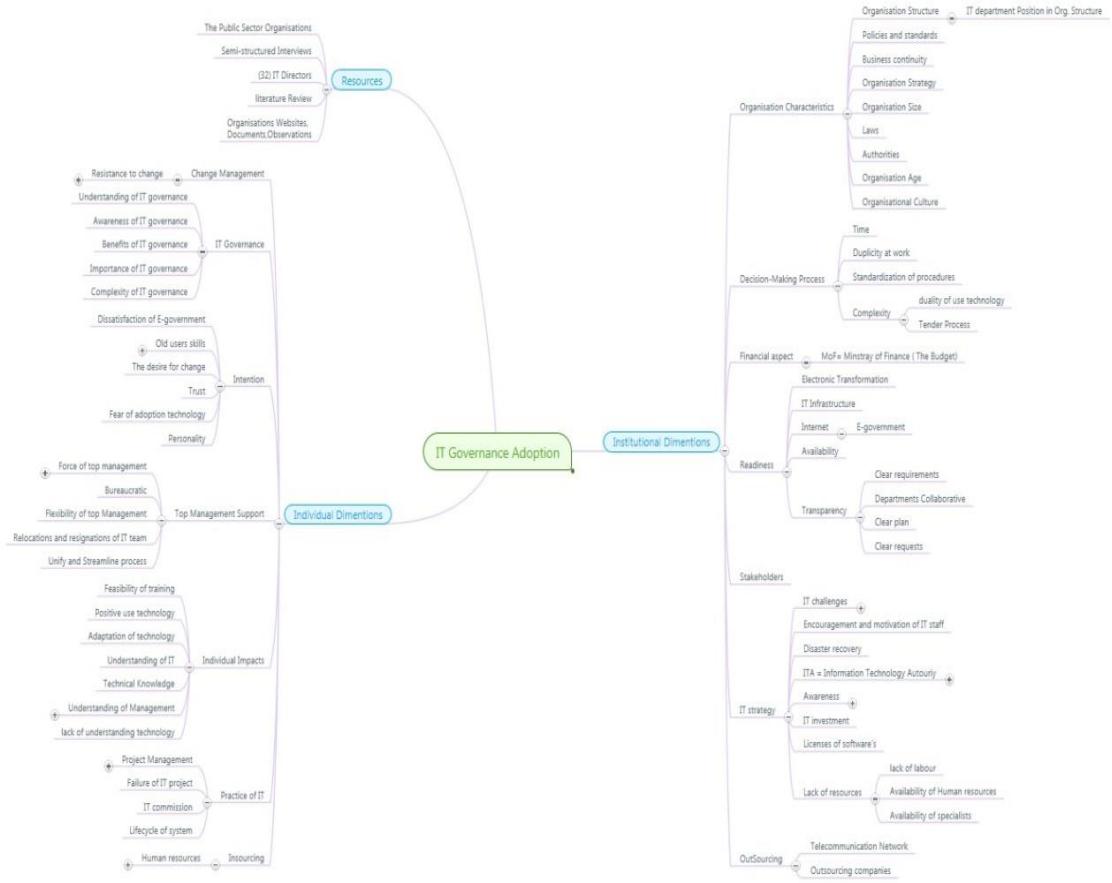

Figure 5.1 The findings of all nodes in the early stage

5.3.1 Findings from an Institutional Perspective

This section provides the fundamental forces that impact the institutional level of organisations, namely readiness of IT infrastructure; top management support, financial aspect, ICT Strategy, and organisation characteristics. All these dimensions contain other related dimensions within the scope of the main aspects.

Figure 5.2 shows the institutional dimensions that were analysed by NVivo and the dimensions most commonly referred to by the participants; for example, top management support and the financial aspect were the most frequent dimensions. Furthermore, the numbers shown from 0 to 30 illustrate the number of participants who focused on these dimensions.

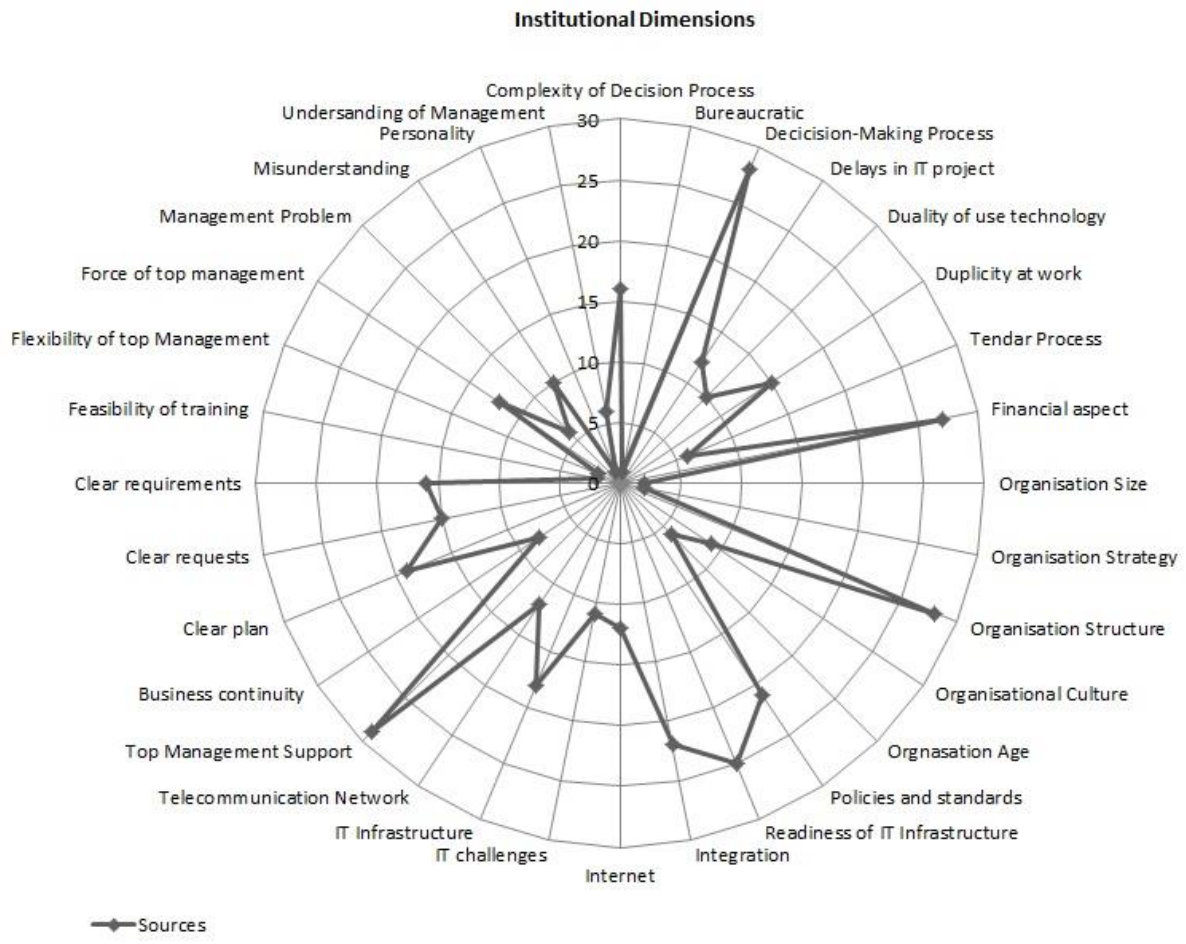

Figure 5.2 Findings of Institutional Dimensions

- Readiness of IT infrastructure

This dimension is the most critical, as studies have indicated. It is the basis of the adoption, application, and use of technology in the digital environment. All of the

responses below refer to the question of readiness of IT infrastructures in the respondents' organisations. There are several levels of readiness in an organisation which might have a practical impact on the adoption and governance of IT. The following examples from the interviews illustrate this:

According to P1:

> *"Yes for readiness, and you need individuals who understand what the required standard is and work accordingly. For example, systems development has specific standards, and you need to work to these standards. The same applies to networks, etc. Therefore, to reach governance, you need to start by finalizing these layers. You should build on solid foundations…Yes infrastructure is important…The network's infrastructure is also an important challenge...".*

P11 added:

> *"The culture of the organisation plays a role here. Some organisations still view the IT department as the provider of Internet and printers. If these are provided, the IT department is considered successful! However, in the coming era of e-transformation, this view is a big obstacle. If all services became e-services, without the proper infrastructure regarding Internet connections, the employee would sit at his desk doing nothing."*

P12 expressed the following view:

> *"No, not yet. No, I cannot say that the ministry has reached the stage of readiness. We still have a long way to go";*

P13 concurred with this view:

> *"Well, regarding governance, our institution has not yet reached the stage of readiness. There is currently a company that is preparing the tables of procedures that are related to governance in government institutions. It also sets up standards, and every institution needs to abide by them. I believe the ITA will adopt these governance standards."*

P20 also perceived a lack of readiness:

> *"No, we have not, of course. Regarding readiness, you always need to plan two steps ahead, and if you ask me tomorrow, I may say we still have four steps to complete. The aspirations are always getting bigger than what we have today. If you had asked me two years ago whether we would achieve what we have today, I would have said no. Two years ago, we would not have expected what are doing today".*

On the other hand, some organisations have achieved readiness, such as that of P18:

> *"Regarding governance, we are ready, and we are working on it, but there are other obstacles that delay things. The policies are implemented, but we are lagging behind when it comes to electronic documentary movement. We were among the first government institutions to adopt electronic documentary movement, but new changes and new developments, which require funds we did not have, have delayed us…Infrastructure is very important, and there is now good work being carried out to address this issue".*

P19 was also optimistic about readiness:

> *".. Therefore, our readiness is 80%. I am not going to say it is 100%, but it is at least 80%, and you know what 80% means. As you know, the data centre has specific requirements in terms of flooring, fire system, cooling, humidity control, etc. All of these requirements are available in our data centre. Fortunately, it operates at the highest technical specifications and it is monitored. It is operational without any problems"*

P2's organisation was also well prepared for the adoption of ITG:

> *"In terms of infrastructure and IT, we are ready. The problem we have is with the 'end user'. They user does not exhibit good acceptance of change. Lately, we have been receiving orders from higher levels, from His Excellency the Minister ,to execute all the changes. But we have faced some difficulty when adopting certain technologies and systems…Well, we are proceeding with our work in this regard, and I can say we have finished between 80% to 90% of the adoption of ITG."*

P22 was similarly optimistic:

> *"Fortunately, this is one of the areas in which we have received excellent support from the top management. We have very good readiness, and we have flexible infrastructure that can be updated in any way. This was initially part of our plans: when we looked into preparing this building, we took into account all the standards necessary—the data security standards, the flexibility standards, the development standards, etc. Therefore, we have the flexibility to modify the infrastructure without many costs. In designing our data centre, we have taken all these aspects into account".*

Referring to Table 5.3, above, the 75% frequency of lack of readiness of resources as a key dimension may impact the adoption of IT governance, as this is a critical dimension supporting the adoption of technology in public sector organisations.

- **Top Management Support**

Top management support is a key force with a significant impact on the adoption of technology in organisations, as demonstrated by previous studies and by the present study's findings. This key dimension plays a prominent role in the adoption, use and acceptance of IT governance, as demonstrated by the following quotes from IT directors answering the question about support from top management:

P1 said:

> *"Yes, support is available. However, he cannot support you if the project is useless…The problem is a management problem…The top official may also take a decision based on erroneous information, and top management must be a facilitator…The management! The management is the number one dimension".*

P10 expressed a similar view:

> *"Frankly, the top management provides excellent support, from both His Excellency the minister and the deputy. After we started this project of e-services, we have a steering committee that meets monthly; the key committee is headed by his Excellency, the minister, and it includes the deputy and the general directors".*

P11 agreed that this was a vital dimension:

> *"Well, the first dimension challenges are the support of the top management."*

P13 raised the issue of laws in this regard:

> *"It is not the support; it is the laws. Even if the top management knows that this process is wrong, they cannot change it; they do not have the authority to change laws".*

P14 said:

> *"The top management is strongly supportive, especially in IT affairs. It is one of their main targets to develop the institution to the point where it is fully IT-competent."*

P2's organisation had received good support:

> *"Actually they have provided all support. Without the top management, we would not have been able to move. We have recently pressed the top management in this regard. We told them that the issue is in their hands; the success or failure of these systems is in their hands. We, in our IT role, have prepared the system, we submitted it to them, but not every party was cooperative. Then, as in every government department, his Excellency the head of the unit issues adoption instructions, so everyone obeys and executes. IT projects are not always easily executed".*

P21 said:

> *"The first issue is the top management. The top management should continue to play a role in IT…That is why I say the top management should*

play a role. In some government institutions, their top management is quite interested in technology, and these are the successful institutions that have fewer problems in this regard. They are successful because their top management is interested in IT, understanding and supportive".

P24 responded as follows:

A: "Do you find the top management supportive for systems and applications?

B: "Very supportive indeed. It is excellent, frankly. In fact, the support of the top management for technical affairs of the ministry is very good indeed. There is a great desire to achieve significant IT improvement and introduce new E-Systems. This is evident in the number of E-Systems in the ministry".

P26 said:

"Well, as for the top management, things differ depending on the project. There are projects that cost more than 100,000, and these require a decision from the deputy minister or even a minister's decision. There are projects that he needs to be aware of and he needs to participate in. The company will come and do a presentation, and then the minister will make his remarks. Sometimes there is a need for a director general to be involved, and this depends on the cost of the project. We, as technicians, are responsible for explaining the technical side and we provide a clear picture of it. We present it to the official, and he evaluates it and takes a decision".

P30 had experienced difficulties with top management support:

> *"It is weak. There is still no awareness of the importance of IT, so we find that the moral support, and sometimes the financial support, is weak…Well, the top management plays a big role…They succeed if there is support from the top management, if they appreciate IT and if there is an active follow-up."*

Most of the responses acknowledged the necessity for top management support to achieve success in IT projects and to support the adoption of technology. Some of the responses were positive about top management aid, stating that senior management were aware of and interested in new technology. Moreover, in some organisations, the IT director reported to the head directly, while others had to pass through more decision-makers before reaching the head.

- **Financial aspect**

This dimension is an important key force in the institutional impact of the adoption of technology. Finance is necessary for the adoption of technical projects. Most studies have investigated requirement for funds for applications and systems. The following examples illustrate participants' responses regarding the financial aspect of the adoption and use of technology in government organisations:

P1 said:

> *"This depends on the type of the project. The measures and procedures are mostly linked to the financial aspect or the level of spending: if there is no available budget, he cannot do anything for you. The financial side is a strong determinant; exactly, it is crucial dimension".*

P10 had experienced challenges in this regard:

> *"The challenge we are facing is the budgets; the budget! It is only the budget. As I mentioned earlier, we receive full support from the office of his Excellency the Minister, personal support. We do not have any other institutional challenges; all our requests are understood by the top officials. The budget is the only issue; only this year, there is a slowing down of the pace because of the current economic conditions."*

P11 agreed:

> *"Of course the financial matters are also a concern. Of course, technology can be costly; financial support is one of the major obstacles…Yes, the budgets. IT is a costly technology, but we need to invest in it".*

P12 expressed a similar view:

> *"Our main problem is that the budget is not that great. There is support, but only within the limits of the available budget. We work according to the budget we have. We cannot launch comprehensive projects because they are expensive and we may not be able to execute them".*

P15 concurred:

> *"Well, the main obstacle in executing projects is the lack of funds. There are projects listed on the plan but they could not be implemented because of the lack of funds."*

P16 said:

> *"Especially the financial issues: this is, of course, difficult, and it requires specific potentials and budgets. It requires clear planning… The another institutional challenge we have is the budget".*

Finally, P18 stated:

> *"It is important that the proposal analysis links the financial and the technical sides; we need to decide the percentage given to both the technical and the financial considerations. There is a very important step in this regard; it is the financial step…the financial issues, the budget…"*

The key finding from this dimension is the critical importance of budgets to support IT projects and the adoption of technology. The economic dimension is essential for the implementation of IT strategies in government organisations, such as IT infrastructure and electronic readiness, which need financial resources as well as the continuity of regulations regarding maintenance and updating requirements.

- **ICT strategy**

The National Strategy for Digital Oman (e-Oman strategy) aims to activate Information Technology and communication to enhance government services, enrich the business sector, and enable individuals to work digitally through the establishment of an integrated infrastructure for the provision of excellent public services for e-citizens and the corporate community in the Sultanate of Oman. This e-Oman strategy is the responsibility of the Information Technology Authority (ITA), which has a significant role in the implementation and application of e-government

and all e-services through consultation and follow-up of Information Technology projects in the Omani public sector.

This dimension was often considered by participants because of its importance in the adoption and implementation of Information Technology innovations in the public sector. Most of the participants pointed out the role of ITA and the challenges and support it provides. The responses cited below are to the question about ITA support and its role in helping organisations:

According to P10:

> *"Yes it does provide support, but regarding strategies and working policies, the picture is not clear. They do not have a plan. And now and then they come up with a new idea, such as E-Oman. This was not initially included when e-transformation was first introduced. We have now 're-engineering,' 'E-Oman,' 'O-gov,' etc. These standards should have been introduced from the start".*

P11 stated:

> *"Well, frankly, the ITA is doing its best. Its mission is to support government bodies in adopting projects and to provide them with expertise. However, coordination with the ITA is not as it is supposed to be, especially in the area of e-transformation. At one time, some ministries started to think of e-transformation as if it were a competition among themselves! This is wrong. The e-transformation of government bodies can be compared to a group which has booked the same travel plans; no one can travel without the rest. E-transformation is not a competition. We have to wait for others, and this is what is happening now. Some ministries have progressed significantly in the*

issue of integration systems with other ministries, but some ministries are still at the first stage of existence. The ITA should have set up certain deadlines and encouraged the sharing of experiences among ministries. We are still not sure about the deadline for achieving e-transformation, but I believe we still need a year or two. We should set a specific deadline to know when exactly we should reach the end of e-transformation, especially now with the problems we are facing because of austerity."

P12 mentioned the following:

"I can add something related to the role of the ITA. In my opinion, the ITA should play a bigger role in the coming stage. The ITA should adopt most applications, especially the shared ones in the governmental sector, and should execute them…Yes, of course. As I said, the governmental sector does not attract qualification, so there should be an institution like the ITA that controls and manages the IT sector. This can be its role because in the other ministries you may not have the experts or you cannot guarantee to have a well-qualified workforce".

P14's organisation had not received much support from the ITA:

"A: Does the IT Authority help and support you"?

B: "Not much really! Particularly regarding projects. Perhaps this is our fault; we quite often work independently."

P17 was also critical about the ITA:

A: "What is the role of the ITA in this regard, in your opinion?"

B: "They play a role, but it is not the role we expect them to play, frankly. We expected further support for our projects. In our experience with the ITA, we found that their role is not clear. If you need consultations, you may have to wait four or five months to receive consultations from the ITA. Sometimes we need to have some of their consultants present while executing our projects, but they reject this request. They only offer to visit and return to the ITA because their consultants can be committed to more than five different government institutions."

P18 made the following comment:

"I think the success of the IT department depends on the centrality of the management. First of all, I would suggest that the ITA takes charge of the legislations and policies. Of course, the ITA has taken control on this issue but in a clear way and with the strength of will required…the role of the ITA is absent. They may have these ideas, but perhaps they are limited by their resources, such as financial resources. They may have their reasons for being so absent in this regard. Perhaps the other government institutions are not in favour of these suggestions. Some officials are not in favour of e-systems."

P19 was also critical:

"There is a conflict, and there is no appropriate e-government. What is the ITA doing? The ITA should be creating unified systems".

P20 added:

"They provide support, but in our view, this support is limited. The ITA should take the initiative, and we would like to see their support materialise rather than just hearing promises and big titles. The ITA is only doing the consultancy side of things now, and even this side is not fully active; perhaps in the future, it will be. In recent years, the ITA has become more active, but they are late. At the moment, the role of the ITA is vague".

P21 responded as follows:

A: "How do you see the role of the ITA"?

B: "In fact, they play a big role. They provide consultations and assistance. They even helped us in analysing some tender proposals. When we request their support, they support us".

P22 was more encouraging:

"Their support is excellent, fortunately. Here at the Authority, the head of the unit and the directors general are excellent. They are highly supportive of IT…we have attended several sessions with the IT Authority to discuss this issue. They have not started implementing it, and as you know, our work is bound by the ITA. For us, issues such as e-transformation and IT governance are under the control of the ITA. We are working with them."

The above responses illustrate the importance of this dimension by taking appropriate measures to achieve the success of ICT in e-Oman, minimise the challenges and encourage cooperation with government institutions.

- **Organisation Characteristics**

This dimension impacts the coordination of official efforts within the framework defining levels and responsibilities in government organisations. As well as duties to obtain information efficiently, these responsibilities include formalization, centralization, process complexity, organisation size, organisation age, organisation structure and integration between departments. This dimension contains many of the institutional categories that may contribute to the adoption and use of technology. Thus, where each dimension impacts directly on the technological application, it is important for them to integrate with each other.

P13 said the following regarding organisation size:

> *"Fortunately, since our institution is a young institution, most of our users actively request IT systems. The users are young men and women who have lots of energy, so they approach us requesting applications. We are not the ones who impose IT. In our case, it is the opposite of what happens in other institutions. Our users are the ones who press for IT."*

P3 had the following to say regarding whether organisation structure had an impact:

> *"Yes! At one time in the past, before the introduction of IT, I worked in a department that reports directly to the minister. This department received full and direct support; there was only one channel of communication. However, when the department dropped several levels in the organisation structure, it had to go*

through longer routes to receive support. Some of its business started to be delayed, and it stopped receiving the same support it used to get from the top official".

P9 said the following regarding organisation age;

"Exactly! This is a growing experience; here at the Ministry, we started adopting E-Systems in 1995. The first system we adopted in institutions was done in 1997-1998. This is a system we built ourselves within the ministry."

Conversely, regarding organisation age, P13 stated:

"Fortunately, since our institution is a young institution, most of our users actively request IT systems. The users are young men and women who have lots of energy, so they approach us requesting applications. It is not us who impose IT. In our case, it is the opposite of what happens in other institutions. Our users are the ones who press for IT".

It is thus clear that this dimension impacts the adoption of technology through bureaucratic procedures within the institution, in which flexibility is required to change some of the laws and regulations that might hinder the making of the right decisions: the adoption of ITG might be an appropriate solution to this issue and might help to achieve transparency. Older organisations with more experience might be at an advantage compared with new organisations. Moreover, organisation structure is also important: the subordination of the IT department varies from one institution to another, with some institutions IT department keeps track of the head and to recent subordination to lower levels, and also the organisational level of IT departments in relation to the Directorate or the Directorate General. Lastly, size may play an important role here, especially in government ministries or agencies

that have branches in all regions of Oman in contrast to those that have only one main branch in the capital of Oman.

5.3.2 Summary of findings on institutional perspective

The challenge of the IT infrastructure is highly influential in the achievement of E-readiness, the awareness of the importance of such systems and their utilization, and the importance of adopting technology and utilizing its outputs. Another challenge faced by organisations in relation to ICT innovations is that of financial resources: this challenge is becoming more evident due to the current financial crisis, as IT needs infrastructure, equipment, and systems, which all require financial support.

Top management support is another important dimension in supporting IT projects by reducing bureaucracy and expanding awareness and knowledge of the importance of the systems and their application by the institution to realise electronic services and achieve a successful ICT strategy. Moreover, the critical dimension is integration between the government institutions through the ITA; this is what is done by the Authority to carry out digital transformation, which needs to speed up to overcome challenges, although the financial crisis might have a role in it delay.

5.3.3 Findings from an Individual Perspective

This section provides the key forces of individual dimensions that impact the institutional level of organisations. All these main dimensions contain other related dimensions within the scope of the main aspects. There are relationships between each of these dimensions and highlight the top ranking dimensions. Figure 5.3 illustrates individual dimensions according to participants' responses via NVivo.

These findings are organised into main themes and sub-themes, which help to support the ranking and integrating of dimensions to identify the key dimensions that influence the adoption of IT governance in public sector organisations. This all individual dimensions most commonly mentioned by participants; for example, the resistance to change and a lack of awareness. The numbers from 0 to 30 illustrate the number of participants who focused on these dimensions.

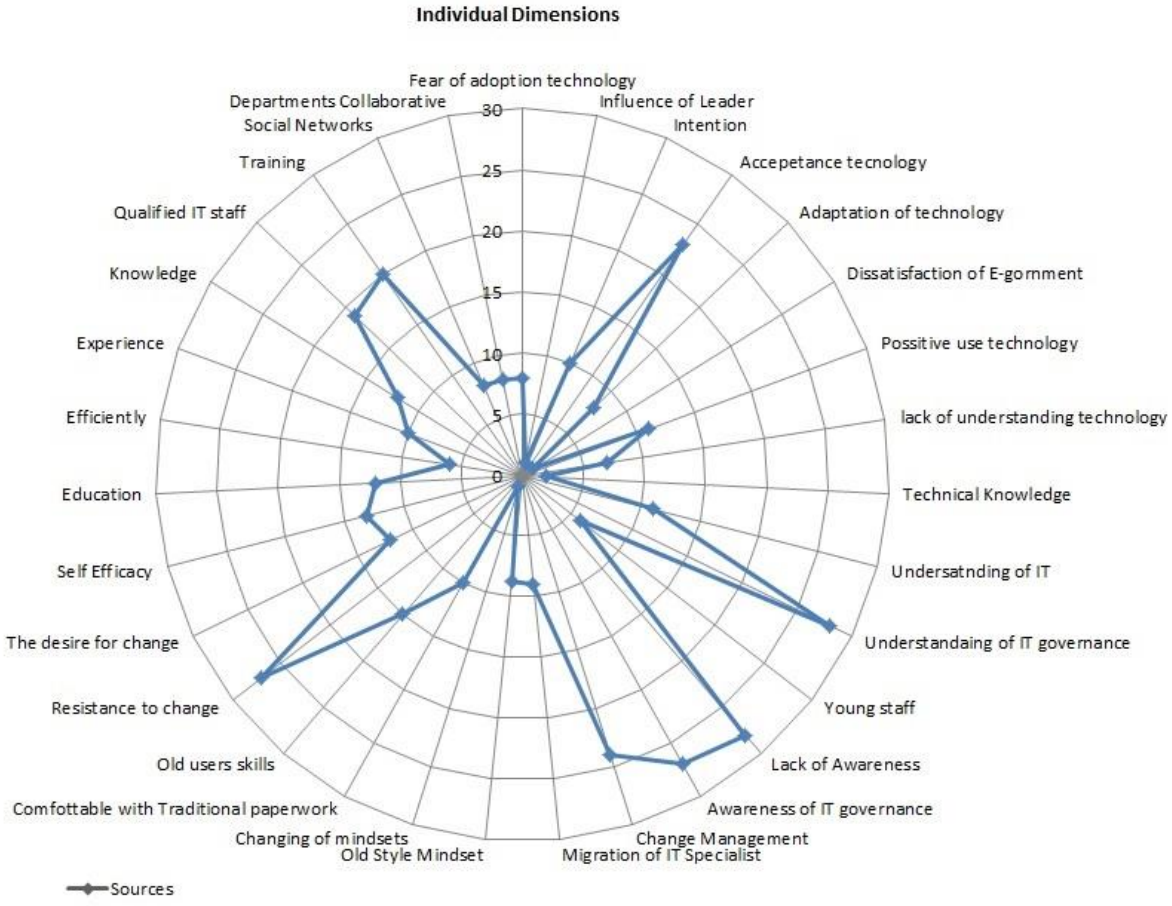

Figure 5.3 Findings of Individual Dimensions

This section provides the key findings from the top dimensions impacting the individual level of government organisations, which are: Lack of Awareness, Resistance to change; Trust in Technology, Self-efficacy, Old Style Mindset, Social Networks, Migration of IT Specialists. All these key dimensions were selected based on frequent responses from participants and integrated with other dimensions at the same individual level to highlight the importance of these dimensions.

- **Lack of Awareness**

An awareness dimension is essential to the adoption of any innovation, such as ITG in government organisations. It plays a significant role in the understanding of innovation and provides knowledge of its value. The importance of awareness lies in the initial stages, before applying the systems, by highlight the functioning and benefits for institutions to achieve their strategy. Through participants' responses, the awareness dimension has emerged between the dimensions that impact the decision to adopt IT governance:

P14 stated:

> *"Well, I can talk about the individuals' level of awareness and their culture when it comes to IT…At the same time, the employees' awareness of the usage of IT is a very important dimension in the adoption of technology…we try to do this via emails and other methods, but the users need more awareness raising than this. The problem is that our resources are modest. The systems department always offers courses for staff development, to teach the employees how to use the systems".*

P16 said:

> *"Yes, training, raising awareness, improving their working conditions, etc. Currently, an IT employee has a different working environment to others; there is programming, constant exposure to computers and electronics, etc. For example, the staff who run the data centres are exposed to certain risks. It is definitely not the same as office work".*

P17's organisation was active in this regard:

> *"Yes, regarding raising awareness. They have good methods of encouraging the employees to accept the systems."*

P20 said:

> *"It varies, of course. It is natural for some people to be sensitive to change. They have become used to certain procedures, and in the beginning, the system may not speed up the procedures; it may slow the procedures because it is a new working method and needs time to get used to. Generally speaking, once the user gets used to the technology, the process becomes faster, and the system is more appreciated. So, this issue of reception varies from one person to another, and it also depends on the explanations and briefings provided by the providers of that new technology. We raise awareness through holding meetings and email correspondence. This raises awareness among users, so when we take a decision to adopt the system, the users are among the supporters."*

P23 concurred about the importance of this dimension:

> *"Yes, to raise awareness. Statistics can support what we say to these people. So these awareness raising attempts can at least reduce the user's resistance. Once the user starts accepting the new change, he or she will gradually feel its benefits. As I mentioned, it is an issue of presentation when it comes to the individual. Marketing the idea also plays a big role, whether by the IT manager or by the public relations and media department. When the IT manager meets with other managers, some of these managers may not be convinced of the new ideas, so the ideas need to be presented to them in the appropriate manner."*

P24 added:

> *"That is why we need to focus on the human dimension in such areas; we need to focus on raising awareness"*

P25 made the following point:

> *"The challenge lies in the awareness of the importance of the systems, the importance of their utilization, and the importance of adopting technology and utilizing its outputs. Also, it is the awareness of the importance of having unified databases to evaluate the work of the ministry, to take decisions and to develop future endeavours…Moreover, as I mentioned earlier, promoting IT and raising awareness are also success dimensions. The systems need to be promoted and there should be efforts to start raising awareness of the importance of IT. Also, there should be change management for IT."*

Participants' responses highlighted the importance of preparing to accept and using technology. This is important to the work of the organisation to achieve its goals and streamline the government work.

- **Resistance to change**

This dimension impacts the adoption of technology from the individual perspective of organisations. Most of the participants considered this dimension to be critical for the adoption and use of any new technology. There are several reasons why this might have an impact, such as users favouring the old style of working, fear of use, continuity of the traditional systems, lack of awareness and knowledge, lack of motivation, the risk of change and traditional thinking. The participants' responses below answered the question about the impact of individual dimension on the adoption of IT, including IGT:

P1 said:

> *"Resistance to change mostly comes from the desire not to change a safe environment."*

P11 added:

> *"There is resistance. People always like what they are used to. For example, we wanted to adopt a new correspondence system. We purchased it four years ago from FileNet SSL company with licenses, but it is only 20% utilised because it was not imposed by the top management. This is a problem we face; there is resistance to new things".*

P12 said:

"Well, I will start with the individual dimensions. There is, for example, resistance to change from certain parties. Acceptance of technology is the main reason for delays in projects. It may also hinder the full utilization of the systems..."

P14 concurred:

"Yes, resistance to change; some people are used to doing their work manually, even if this takes them a lot of time. They are used to this, so when asked to use IT, these people may find it difficult. However, after a while, when these people find that IT yields better findings and their work is now more focused and organised, they will adopt it more wholeheartedly".

P17 also mentioned resistance to change:

"..Change management has been a priority for us. We knew that employee resistance would be the one thing that could cause the failure of the project. Our change management team is quite strong…"

A: "In your opinion, what are the pressures that exist within institutions when adopting any form of technology?"

B: "Resistance to change".

P23 agreed:

"Well, any change will often lead to resistance, so change management plays a role here. The manner in which we convey new ideas to the users play a role, and sometimes we need to get some influential people involved in the change.

We need to try to understand, as much as possible, the users, their needs, and their desires".

P25 said:

"The most common individual dimension is acceptance of IT, and resistance to change is a dimension you encounter in all government institutions."

P26 concurred:

"Change management! Change is a major obstacle for anyone. So, the biggest challenge we face in this regard is change and resistance to change. Without the support of the top official, we would not have reached this level of change and transformation now. Therefore, within the plan of our project, we have included the issue of change management. We have recruited experts in change management to help us with the steps necessary for changing something. They also helped in educating people about this change and in raising their awareness that this change is beneficial to them. Throughout the projects we had a plan called the 'culture of change'…"

P27 added:

"Well, change is not easy, especially in IT-related areas. Change is not easy, especially for senior employees. Some of them have been using the same system for twenty years, so if you offer a new system to them, a more modern and easier system, they will still prefer the system they are used to."

This dimension emphasises the importance of awareness, education, training and user participation in the alignment for the adoption of the technology, which may help to reduce the resistance to change and increase acceptance of the technology. Motivation is also essential for dealing with the old style of users and reducing traditional thinking.

- **Trust of Technology**

This dimension also has a serious impact on the adoption of technology in organisations. The importance of investing in the building of trust and the expression of transparency requires considerable time and effort. Furthermore, the loss of confidence in technology is a potential threat to organisations. In answer to the question about the desire to adopt new systems such as IT governance within organisations, the participants gave the following responses:

P1 stated:

> *"When everyone manages the business he or she knows and trust is gained, everything is executed faster and better."*

P14 said regarding Trust:

> *"If these are non-existent, how can you adopt a system or a new technology? In such a case, even if you adopt the system, it won't be reliable and trustworthy because it is not built on the clear policies and procedures of the institution."*

P18 made the following comment:

> *"We prepare the specifications carefully, and we study the needs, but if we have to wait six months for the committees, the requirements and specifications*

themselves may change over this lengthy period. Technology changes very quickly. These are the obstacles we have. The problem lies in the issue of management or the lack of full trust. "

P19 emphasised the following:

"Cooperation among the employees themselves, regarding welcoming new systems, and also cooperation with the top management. If I assign any task to an employee and if he or she says they cannot do it, I, as a director, have no problem doing it myself, but I cannot be working on my own. I am a human after all, and I need the cooperation of others. Cooperation is key to the success of the IT department".

P5 said:

"Yes, lack of faith in systems. We find this in some departments. For example, in the legal departments and the human resources department, they are still more dependent on paperwork than others; they still feel that paper offers reliability and documentation. Now as for the institutional dimensions, the legislations, and the organisational structures should be reshaped to ensure that IT departments report directly to the minister or the head of the unit. This will help us to eliminate the long route of bureaucracy we have just talked about. IT departments should also be prioritised regarding budgets. Currently, you find that in each unit, the yearly budgets for IT are focused on purchasing equipment, printers, printer ink, etc., but IT is not limited to these items. There is faith in IT and acceptance."

P6 mentioned:

> *"The struggle between business and technology as well as support. I am talking here about the government; I do not know what the situation is in the private sector. The government has become used to being somewhat authoritarian; unable to accept the others' point of view easily. This mindset needs to be changed; the government should see itself as a part of a production system. We need to get rid of the old-style, bureaucratic mindset. The rest of the world is advancing not because they are more competent than us but because they have re-designed their administration to become a production player".*

Organisations fear that rapid technical change will increase the complexity of data and pose a threat to information security, which in turn leads to a greater level of risk resulting from information technology. Therefore, they will not trust in the future in the digital age unless they have confidence in their data and the security of their information systems and strengthen their ability to respond flexibly to changes to ensure the success of digital change projects.

- **Self-efficacy**

Self-efficacy serves as an indicator of an individual's ability to control his or her personal actions. A person with a sense of high self-efficacy can behave more efficiently, and is more able to face the challenges of the environment, make the right decisions, and set a high standard for future goals. However, a lack of self-efficacy is associated with depression, anxiety, helplessness, low self-esteem, and pessimistic thoughts about the extent of one's delivery capacity.

Self-efficacy thus has an important influence on the acceptance and the desire to apply new technology in the organisation by providing motivation towards improving

individuals' ability and skills. The responses of participants regarding this dimension were as follows:

P13 said:

> *"The most important individual dimension for the success of projects is to have a well-qualified IT team in the institution. If your IT employees cannot understand the work, the users will directly communicate with the contracting company for the technical issues, and there will be a sort clash between the users and the company; the users may complain that the company's descriptions are not clear. So you need your IT team to act as an effective intermediary agent that understands the IT and reports back to the institution".*

P16 agreed:

> *"Yes, training, raising awareness, improving their working conditions, etc. Currently, an IT employee has a different working environment to others; there is programming, constant exposure to computers and electronics, etc. For example, the staff who run the data centres are exposed to certain risks. It is not the same as office work."*

P28 said:

> *"Well, we organise internal training courses. Our institution also offers the staff external training courses. This applies to any new system that is adopted in the institution. Sometimes we send an employee to get external training and then he comes back and trains his colleagues inside the institution. We want to make sure that everyone is aware of the new systems and all the new IT updates. We send them to international conferences and conventions so that they are trained*

and they get to know what is now available worldwide and on the market. This way, our employees can keep up with the new developments in the world of IT, and then they can come back with suggestions which will simplify the procedures inside the institution."

P31 said:

"Also, the training incentive is a challenge; before launching any project, this team offers training courses to the employees, and they explain the project to them and its utility".

P19 reported the following challenges:

"The challenges are very numerous. For example, there is no recruitment of qualified technical support staff. The IT department should be qualified to run and manage all the systems of all different levels. The major obstacle in this regard has been removed; I mean the affiliation to the head of the unit has solved many problems. But currently, we face a very big challenge in the area of providing qualified and specialist staff. If we want to recruit an expert, he would demand thousands in salary, but of course, we cannot pay such salary; the civil service employment here incurs salaries of grade nine or less."

P27 had experienced the following issue:

"One of the problems we face is the skillsets in the development division: I mean the programmers we have. Of course, the guys are doing their best, but we still need more skills in this regard. Currently, the systems and programs are done by companies, especially in the governmental sector, and this is one of the problems of the public sector."

The examples quoted above note the importance of the impact of this dimension in the adoption of technical innovations through the training, education, knowledge and readiness skills of IT workers. This matter helps with the acceptance of modern technology and the adoption of ITG in the government and with willingness to deal with modern systems.

- **Old Style Mindset**

Conflict surrounding technical changes in the traditional work environment still represents a challenge to the acceptance and adoption of new technology within organisations. One reason for this is traditional thinking and familiarity with traditional working methods and lack of familiarity with the digital environment, especially among senior users and older staff. The participants' responses in this regard explain the importance of this dimension, as illustrated in the quotations below:

P23 said:

> *"There is, of course, a group of people who do not welcome anything new. Therefore, we have to try as much as we can to convince them of the new ideas, and we have to explain to them the benefits they will reap from using the system. Now and then we prepare leaflets about the system."*

P6 added:

> *"Now these are challenges, and the project of e-government is an ambitious project. Every Omani involved in it must have patience, because this is a transition process: I am moving people from one stage to another. This transition requires a change in management. So we are talking about mind-sets and logic; it is not just IT."*

P9 made a similar point:

> *"I believe that changing the mind-set of the leaders or directors is very important, to be more transparent. Setting out plans and finding alternatives are also important requirements".*

P30 said:

> *"Therefore, there is the challenge of raising awareness among individuals about what IT is. Actually, the biggest challenge is the management of change; how can we change people's mindsets."*

P32 stated:

> *"I totally believe that these dimensions originate in the users. Some users, especially the senior users, do not enjoy dealing with E-systems. They prefer paperwork, and some top officials are more comfortable with paper. This is the most important challenge we face".*

P27 concurred:

> *"Well, change is not easy, especially in IT-related areas. Change is particularly difficult for senior employees. Some of them have been using the same system for twenty years, so if you offer a new system to them, a more modern and easier system, they will still prefer the system that they are used to. Even upgrading from Windows XP to Windows 7 or 10 was resisted by some people. They say, 'Everything has changed. I don't know what to do.' This is a person who has not developed his or her skills, and technology is always developing; it will not wait for anyone".*

As a result of this dimension, users' satisfaction can be improved through the provision of technical exercises to facilitate their use and awareness of the importance of modern technical means and by working to motivate them. It is also vital to raise awareness that the traditional methods are not functioning for the development of talent and to focus on ease of use. Moreover, staff should be able to use different types of communication to respond to these changes.

- **Social Networks**

This dimension emphasises the importance of cooperation between the departments of the organisation to create an encouraging and enthusiastic social environment for the application of new technology. This will benefit the organisation by increasing the value gained from IT and align it with its strategy to achieve its goals. Duplication, personalization and other issues that may impact the adoption of modern systems also create a digital gap between institutions and other agencies that provide technical support and deal with social team networks. In this regard, the participants' responses to the question of the significance of the social environment within the institution were as follows:

P1 stated:

> *"Yes, all should work towards achieving the target. One hand alone cannot clasp! So you need others to team up with you. If they do not, you will feel as strong on multiple fronts. This also is related to management. The management should manage the different units to work collaboratively to achieve the desired targets".*

This respondent also added:

> *"After all, work is collective. The work cannot be individual; it is collective. A good and well-informed official cannot achieve much if he does not have a good staff in IT. The opposite is true as well. A good and well-informed IT staff and their director cannot achieve anything if the top official does not care about technology. The whole team needs to collaborate with the institution to reach its goals. So, I believe that matters such as jealousy and hearsay have little impact. I may hear from family and acquaintances that a certain project is good and I may want to adopt it, but if I cannot reach certain officials, I won't be able to do it".*

P17 said:

> *"So this is one of the problems we are facing here. The other departments do not know exactly what the IT department does. They believe that the IT department does everything."*

P19 gave a succinct response:

> *A: "What are the dimensions that lead to the success of IT?*
>
> *B: "Cooperation!"*

P21 agreed:

> *"Yes, modifications and the need to chase the work from one department to another. These are the problems that we face, in fact: Cooperation between the IT teams and other employees. The problem is mostly in e-transformation. Some employees have been working with pen and paper for over twenty years, so you*

cannot come overnight to install a computer and ask him to work via the e-system. This is difficult for him even if it saves 100% of his time and effort. They would say, 'I do not want this; I am not happy with it!'"

P25 made the following point:

"Another success dimension is to collaborate actively with the end-user when you build any e-system. If the end-user is far from the IT team when building the system, this leads to big problems. In all the stages—planning, analysis, design and evaluation—the end users should be our partners in the system project. There are many international examples for building E-Systems, but the most prominent is the one where you create a virtual user to be a point of reference for your work. This virtual user needs to be created on the basis of what the actual users need from this system."

P28 said:

"They are flexible because we adopt a system; all relevant parties are invited to get involved: all employees at the different levels in the organisational structure. These include the employees who will use the system, the department managers, the directors-general and the decision makers. We listen to their opinions, and the system is built based on their views and requirements."

The participants' responses to this dimension clarify the importance of cooperation and exchange of knowledge by social communication between the different departments within the organisation. This would be advantageous to the adoption of technology and would create an environment of transparency that is supportive of the technology.

- **Migration of IT Specialists**

The importance of this dimension is the migration of specialised staff, especially in the IT field, as brain drain is considered to be a significant challenge in the application of technology. In particular, migration from the public sector to the private sector must be addressed by improving working conditions. Incentives, encouragement, training and honing of valuable skills thus create a balance in the level of knowledge within the organisation and encouragement to keep up with technology. Participants' responses in this regard were as follows:

P27 said:

> *"Let me be frank; some ministries do not have programmers at all; they rely on companies to do their programming for them. The reason, of course, is that the programmer in the market can ask for a certain price, so why should he get employed in a government institution and earn the civil service salary?! A programmer in a government institution can leave for the private sector and earn double or triple his salary. This has happened to us; we have lost programmers who leave to work in the private sector. This is a major problem; there are not enough programmers in the ministries, and the ones available have limited experience."*

P31 made a similar point:

> *"Another issue I would like to mention is that the technical personnel should receive more attention and support. Recently, we have suffered from the migration of expertise; employees have moved to work in private companies. We train the employee for a long time. Then, because of the lack of incentives here, this employee will move to another place. Therefore, this area of technical personnel needs to be studied and addressed. We have lost many good employees."*

P4 added:

> *"As for the individual dimensions, there is a lack of expertise. Now this is a highly personal matter, but even though the training is good, the employees sometimes lack the motivation to work hard and be creative…"*

In summary, the migration of IT specialist competencies might impact the development of the information technology sector within these institutions. Therefore, there is reliance on foreign companies in the adoption and implementation of IT projects, which might incur high financial costs that may prevent or delay technical projects.

5.3.4 Summary of Findings on the Individual Perspective

Individual challenges to the adoption of innovation or technology in general and IT governance in particular are a set of dimensions that impact decision-making in the public sector. These dimensions have been mentioned in previous studies and validated by this study. For example, awareness is necessary for understanding and

knowledge of innovations for the development of institutional work, as well as cooperation between the departments and individuals within the organisation, and is a positive factor contributing to the adoption and use of innovations. Self-efficacy is also important in the development of skills and willingness to accept new technology and develop experience in dealing with applications. Another dimension is resistance to change in the organisation, which requires the setting of plans to deal with new innovations, awareness, and support through change management initiatives. The Trust in Technology dimension plays a crucial role in satisfaction with the use of the systems and in establishing a reliable workflow. In addition, traditional thinking and satisfaction with traditional work methods by older staff are challenging to other enthusiastic young staff who are keen to use innovations. Last but not least, encouragement and motivation are important to maintain professional IT staff: otherwise they will look for better conditions and migrate to various other sectors.

5.4 Findings on Critical Success Dimensions

Based on the data collected and analysed from thirty-two interviews, and from observation and document analysis, the major success dimensions that can help government organisations to adoption new technology in general and IT governance in particular in Omani public sector organisations can be summarised as follows:

1. One of the most significant success dimensions for the IT department is to have clear strategy plans for IT, which are built on a clear vision and targets, and which meet the actual needs of the different parties within the unit. Also, the plans should push the work towards development.

2. The second success dimension includes working according to international IT standards: without these criteria, the systems built will be fragile and

institutions will find themselves unable to continue using the systems and will be faced with endless challenges and problems. Therefore, IT projects should be built from the outset according to a set of international standards such as IT governance standards.

3. Another success dimension is to collaborate actively with the end-user when building any e-system. If the end-user is far from the IT team when building the system, this leads to significant problems. In all stages—planning, analysis, design and evaluation—the end users should be partners in the project. There are many international examples of the building of e-systems, but the most prominent creates a virtual user to be a point of reference for the development work. This virtual user needs to be created on the basis of what the actual users need from this system. All that the users need, their specific targets and their requirements over the years, should be gathered in this virtual user, so that it becomes an expertise repository and can be referred to when there is a need to create systems in the future. If there is a need for a new system in the future, the IT staff should meet with the users and compare their needs to those of the virtual user. If the current requirements are new, they can be catered for and also added to the virtual user repository. It is critical to have the user as a partner at all stages of producing an e-system.

4. Fourth, as mentioned earlier, promoting IT and raising awareness are also success dimensions. The systems need to be promoted and there should be efforts to raise awareness of the importance of IT and its benefits.

5. There should also be change management for IT acceptance and new innovations.

6. Another success dimension for IT is to improve skills and qualifications in the team. Building skill sets in IT is not like anything in other directorates because technology changes daily. Therefore, one of the success dimensions is to be able to keep up with the accelerating technological advancements worldwide by increasing expertise in the IT team. The team members need to be qualified, trained and aware of all new technologies. When they ask about participating in a conference or a training course, this opportunity should be made available to them despite the possible financial challenges of doing so.

7. The seventh success dimension is to have good infrastructure, such as an excellent data centre, a good network, efficient lines of communication etc. If the infrastructure in the area of technical support and equipment is strong, the IT team will also be strong.

The eighth dimension is to have strong data security standards

5.5 Findings of Challenges/Barriers

The findings of this study identify several problems that might be faced by public sector organisations that depend on information technology, such as the importance of effective management to be able to meet these challenges, and inevitably to be exposed to the risk of failure of the institution. All organisations and individuals face common challenges and so it is important to identify the different environmental, political, geographical, economic and social issues that might threaten effective information technology governance.

Several dimensions in the adoption and acceptance of IT governance are identified, such as:

- Lack of top management reliance on information technology, which is the main issue hindering the success of IT projects, as senior management are unwilling to rely on information technology in the decision-making process;

- Lack of financial support: this is an important dimension which supports IT projects and spending on aspects such as readiness of IT infrastructure, the internet, and security issues.

- Lack of alignment strategy, which weakens the enterprise's impact in contributing to the efficient and effective achievement of organisational goals;

- Ineffective resource management: To achieve the best findings at the lowest cost to the organisation's resources, management must use information technology effectively and efficiently, in terms of making sure that there is sufficient technology and hardware, software and human resources to provide IT services.

- Lack of risk management: risk management is the key force behind the success of most information technology projects, including managing risk assessment of all potential threats to the project and mitigation. If these issues are not addressed at the beginning of the project and the problematic system is applied, there is a high risk of failure, and the greatest damage is often related to IT risks that are not understood by top management.

- Motivation: The importance of this dimension lies in the desire to use modern technology in the organisation. This motivation comes through incentives and encouragement, and through systems' compatibility and alignment with the

work environment and understanding of how to take advantage of them. Participants' responses on this dimension show its importance to the adoption and implementation of new systems and innovations in government organisations. These arise through incentives encouraging and identifying the feasibility of innovations to simplify the workflow. Moreover this dimension is important in effective IT adoption and implementation within government institutions so that the convergence of appetite and a desire to use and practice new technologies. The effectiveness and benefits of these systems, or of any new technology such as ITG, help to reduce the lack of desire to use them when their value and ease of use become apparent.

To summarise, the above barriers to the adoption of innovations in public sector organisations, including ITG, can be divided into four aspects as follows:

Organisational aspects: lack of awareness of the application of e-innovations among top management/leadership; lack of attention to new innovations; lack of legislation and regulations governing e-governance programs to deal with computer crimes and security breaches; resistance to change by some managers and those with power, who might believe that the change to e-governance is a threat to their authority; lack of regulations and administrative regulations for organizing electronic transactions.

Financial constraints: the high financial cost of using the World Wide Web and the Internet; lack of financial resources for the infrastructure required to implement e-governance, especially networking and linking sites and providing hardware and software; lack of financial support for the training and qualification of human elements required to implement electronic administration; salaries and material and moral incentives to encourage workers in the field of management information

systems; the lack of adequate financial resources to update the hardware on an ongoing basis, especially since information technology is constantly evolving, which necessitates updating devices.

Human aspects: the vagueness about the concept of IT innovations of some leaders; lack of clarity to the concept and provision of the intellectual ground for its implementation; lack of qualified human frameworks to deal with the digital age and its applications and electronic services; lack of specialists in computer software, whether in the area of maintenance engineers or programmers; lack of experienced staff who have knowledge of basic skills in the use of computers and the Internet; lack of training and skills development programs in the field of advanced technology; modern technology influence workers fears for their interests, and the implications of downsizing and reduced incentives and regulatory emphasis; apprehension in government agencies about electronic transactions in case of leakage or loss of personal information.

Technical constraints: lack of infrastructure for many institutions and lack of readiness to receive the technology to switch to e-governance; complexity of new innovations and technology; weak technological capacity for networks in some areas; limited availability of Internet services for appropriate electronic management; adoption of most programs and information to foreign language networks; poor infrastructure at the State level, hampering the application of electronic management in their institutions as a whole; different specifications of electronic devices used, making it difficult to link them.

Information security aspects: information security is one of the most important constraints in applying e-governance; fear of not being able to protect the database from intrusion or sabotage; fear of disclosure of information by employees or

beneficiaries of the system; fear of losing information or introducing inaccuracies when performing updates on the administrative system.

5.6 Chapter Conclusion

This chapter has presented the findings from the data analysis. It identifies various dimensions which may challenge and impact the adoption of IT governance or any other new system in public sector organisations. There are also are critical success dimensions that might help and support the decision to adopt such technology and acceptance of its use.

Table 5.4 summarises the dimensions derived from analysing the data from multi-level organisations, which might impact the adoption of technology in general and of IT governance in particular.

Levels	Dimensions	Related of dimension
Institutional Level	Top Management Support	Awareness, knowledge
	Complexity of decision process	Bureaucracy, difficulty of technology
	Readiness of IT Infrastructure	IT infrastructure, the Internet, Telecommunication company
	Financial Aspects	Budget, cost of innovation and technology
	IT strategy and priorities	Policies and standards, information security, risk management, IT vision and plans
	Organisation characteristics	Organisation structure - IT department dependency, organisation size and age,
Individual Level	Lack of awareness	Knowledge, understanding, interest
	Resistance to change	Different tools to respond
	Trust of technology	IT security, confidence, threat
	Self-efficacy	Training, education, IT skills
	Old style mind-set	Traditional thinking, routine processes
	Social networks	Cooperation between all aspects, Teamwork
	Migration of IT specialists	Incentives, encouragement, retention of qualified personnel

Table 5.2 Multi-level dimensions

A SWOT (Strengths, Weakness, Opportunities, and Threats) analysis of emotions that impact the adoption of IT governance might also be useful, and is set out in Table 5.5 below:

Levels	Strengths	Weaknesses	Opportunities	Threats
Institutional	• Flexibility • Internet • Up to date with advanced technology • Increased Transparency	• Limited budget • Laws and regulations • Decision-making process. • Organisation characteristics • Integration • IT readiness • Lack of standards • Software licenses	• IT investment • Competition • Transparency • Re-engineering • Effectiveness & Efficiency • Motivation • Availability of IT • The use of IT standards.	• Bureaucracy • Corruption • Lack of discipline • Change Management .
Individual	• Positive attitude to IT skills • Human capacity • Modernity of technology • ICT standards use	• Lack of education • Lack of training • Lack of competition • Lack of IT skills	• Improving the IT skills • Availability of labour • A awareness	• The brain drain of IT staff • Resistance to change. • Security and Risk • Reliability of technology

Table 5.3 SWOT analysis of dimensions

Table 5.5 presents the SWOT analysis that might impact an adoption of IT innovations such as ITG and a set of criteria that be taken through aspects of organisational and individual perspectives.

Table 5.6 offers a summary of the findings based on the pillars of theories and other dimensions related to specific levels.

Themes	Model	Sub-Themes	Seed Categories	Emerged categories
Institutional Dimensions	Institutional Theory	• Regulative	• Laws • Sanctions • Rules	• Impact of organisations' size and age • Rules and Regulations • Lack of top management support • Impact of organisational structure • Impact of IT budget
		• Normative	• Accreditation • Certification	• Training, knowledge, awareness
		• Cultural-Cognitive • (Mimetic)	• Prevalence • Isomorphism	• Organisation culture, trust
	Institutional impacts	• ITA support • Financial aspect - MoF • Change management • Resistance to change	=	• ITA = Information Technology Authority (IT strategies/Oman), • MoF= Ministry of Finance (Government Budget), • Limited human and financial resources (structural dimensions), • Fear of risk, complexity of the decisional process (strategic dimensions), • Offices/services (management style) – type of organisation, • Subordination of IT department

				(organisation structure), • Change management /resistance to change
		• Decision-making process	• IT adoption process	• Complexity, time of decision, long process
		• Readiness	IT Infrastructure	• Lack of network communication, • Lack of internet speed, • Lack of technical knowledge, • Electronic switch – E-government transformation
		• Top Management support	=	• Lack of top management support
		• Understanding Of ITG	=	• Lack of awareness, understanding
Individual Dimensions	TPB	• Attitude • (Behaviour Beliefs)	• Relative Advantage • complexity	• Positive about the adoption of ITG • Flexibility to use of ITG • Increased transparency by ITG • Usefulness of ITG, • Great idea for approval of ITG
		• Subjective Norm • (Normative Beliefs)	• Normative impacts	• Training, knowledge • understanding, awareness
		• Perceived Behavioural Control	• Self-Efficacy • • Facilitating	• Organisation structure, IT department (position and follow) • Organisation process

		• (Control Beliefs)	conditions	• Lack of resources (human, non-human), • Facilitating conditions • Self-efficacy, compatibility, motivation
	Individual Impacts	• Demographics • Cultural • behavioural	=	• Demographics: age, education, experiences, gender • Fear of risk, traditional work, change of mentality (cultural dimensions) • Misunderstanding of the objectives (behavioural dimensions). • Lack of professionals – (Brain Drain) migration of IT professional

Table 5.4 The findings based on the theoretical pillars of this study

The next chapter discusses the results of this study in comparison with previous studies and offers the significance of the findings of this study and their similarities and differences from other studies. It also presents a conclusion and examines the fit of selected theories that are commensurate with the study findings, as set out in Table 5.6.

Chapter 6: **Discussion of Research Findings**

6.1 Introduction

This chapter relates to the interpretation of the findings of the research, as set out in Chapter 5. It makes reference to the literature dealing with previous work in the field, as reviewed in Chapter 2. The discussion is presented in three main stages to allow a thorough exploration of this research regarding the adoption of IT governance: these stages are the impact of institutional dimensions, the impact of individual dimensions, and how this synthesis of dimensions influences decision-making for the approval of ITG in public sector organisations. It is important to note that some of the dimesnions are heavily discussed owing to the fact of their extensive examination in the ITG literature.

Table 6.1 shows the dimensions that impact ITG based on multiple theories, with each pillar of these theories being considered at multiple levels.

Institutional theory			Theory of Planned Behaviour (TPB)		
Level	**Dimensions**	**Impacts**	**Level**	**Dimensions**	**Impacts**
Institutional	Normative Pressure	Societal expectations, values, and attitudes impact the use of ITG	**Individual**	Attitudes (Behaviour Beliefs)	Interested in using ITG
	Cognitive Pressure (Mimetic)	The use of ITG is accepted and perceived as something normal.		Subjective Norms (Normative Beliefs)	People impact decisions on ITG
	Regulative Pressure (Coercive)	Laws and rules, incentives and sanctions impact the use of ITG		PBC (Control Beliefs)	Ready to use and support ITG

Table 6.1 Integration of multiple theories for this study

6.2 Institutional perspective

This section answers the first question of this study, which is related to the discussion on the institutional context based on institutional theory as a guide to understanding the institutional level in government organisations. The three main pillars of this theory are mimetic, normative and coercive pressure. This study's findings support previous studies that have used institutional theory to explain the choice of ITG adoption in organisations, such as the works of Ben Boubaker et al. (2008) and Jacobson (2009), as well as Teo et al. (2003), who studied institutional pressures in organisations and stated that these pressures have a direct impact on

adoption intention. They also support the work of Scott (2008), who provided an overview of institutional impacts in institutional theory. Table 6.2, below, shows how this study fits with the pillars of institutional theory through the findings from the literature review as seed categories and these study findings as emerged categories.

Institutional theory Pillars	**literature review (Seed categories)**	**Current study findings (Emerged categories)**
Regulative (Coercive)	Laws Sanctions Rules	Lack of top management support Impact of Budget for IT investment IT strategy – ITA support
Normative	Accreditation Certification	Lack of training, knowledge Lack of awareness of ITG
Cultural-Cognitive (Mimetic)	Prevalence Isomorphism	Readiness of IT infrastructure Organisation culture – trust Impact of organisational characteristics (structure, size, old/new, services/offices)

Table 6.2 The findings based on the pillars of institutional theory

ITG adoption in the public sector based on institutional theory and the impact of dimensions at the institutional level of government organisations are discussed below in light of the study findings.

6.2.1 Lack of Readiness of IT infrastructure

According to ITGI (2007), IT infrastructure is essential and IT resources should be carefully managed and invested to ensure their availability. This is supported by previous studies such as the works of Gheorghe (2010), Weill and Aral (2004) and Weill et al. (2002), which confirmed the importance of readiness of IT infrastructure when adopting ITG.

Readiness in this section is defined as the degree of preparedness of the organisation in terms of IT devices such as hardware, software, network infrastructure, databases, websites and the Internet. It covers the ability to handle electronic services and readiness to address security threats and risk management. In the Omani public sector, as a developing national economy, all ministries and government agencies are required to transfer to e-government services in line with the e-Oman IT strategy through the ITA. It is necessary to be ready with IT infrastructure that fulfils the standards and specifications: this naturally creates challenges in terms of material costs incurred, which also depend on the size of the organisations and the nature of their work, such as whether they provide services to citizens or offices. This study finding was consistent with previous studies that have pointed to the significance of this dimension in influencing the adoption of technology in general and of ITG in public sector organisations in particular.

6.2.2 Lack of Top Management Support

According to Sedera et al. (2004), TMS can be defined as the level of commitment by senior management in the organisation to the adoption process, regarding their involvement and the willingness to allocate valuable organisational resources. Like previous studies (e.g. Siddiquee, 2005; Cater-Steel, 2009; Othman, 2016), this study finds that such support is an important dimension influencing the adoption of technology. For other studies discussing the importance of TMS in influencing adoption, see the works of, for example, Latif et al. (2010), Winniford et al. (2009), Willson and Pollard (2009), Cater-Steel (2009), Bhattacharjya and Chang (2008), the IT Governance Institute (2008b) and PwC and ITGI (2007).

In the implementation of a change, top management can either be a key motivator or an obstacle (Beer, Eisenstat & Spector, 1990). TMS refers to the dedication to and enthusiasm for a change demonstrated by senior management, as displayed through involvement, a willingness to assign necessary resources and an overall positive attitude towards the change (adapted from Sedera et al., 2004).

Importantly, the literature on empirical IS studies includes a significant body of work detailing and emphasising the value of TMS in regards commitment, leadership and understanding if adoption and deployment of new innovations and technology is to be successful and effective (Armstrong & Sambamurthy, 1999). The ITG literature similarly emphasises the importance of top management leadership and support, as can be seen in a number of works (e.g. Delmas, 2000; Guldentops et al., 2002; PwC & ITGI, 2007; Bhattacharjya & Chang, 2008; IT Governance Institute, 2008b; Lee et al., 2008; Cater-Steel, 2009; Willson & Pollard, 2009; Winniford et al., 2009; Latif et al., 2010).

TMS plays an important role in determining the success or failure of IT projects. It depends on a clear understanding of who is responsible for the project, a clear strategic vision for the organisation and an overall comprehension of the concept of e-governance. TMS also plays a key role in planning, implementation and development and in the creation of a new organisational culture. Furthermore, it influences the creation of innovative capabilities, the level of flexibility of the organisational structure and its suitability for electronic management. TMS can also provide direction and support in monitoring, evaluation and follow-up processes. All of the abovementioned factors have a significant impact on the adoption of ITG or, indeed, any new technology. Thus, a lack of TMS will have a negative impact on the adoption of ITG in government organisations.

6.2.3 Lack of Financial Support

This study is consistent with previous studies on this critical dimension in the adoption of technology. The financial side must be in place to support the IT infrastructure, as well as to help in the development and modernization of systems in addition to the purchase of information technology. Thus, the availability of financial resources helps organisations to prepare for e-government services and for the adoption of ITG and for any applications, databases and online services through the organisation's website.

Cost has often been presented as an obstacle to the decision to adopt innovations, including ITG. Numerous studies have confirmed the impact of this dimension: see, for example, Winniford et al. (2009); Fomin et al. (2008); Bhattacharjya and Chang (2008); Barlette and Fomin (2008); Guasch et al. (2007); Staples et al. (2007); Zutshi and Sohal (2004).

Similarly, the global economic crisis may significantly impact the availability of countries' financial resources. This creates a challenge, especially with regard to the national economy for the public sector, because of limited budgets. Oman as a developing economy has been impacted by the current economic crisis and has thus reduced its spending and controlled its financial investigations and other resources. As a result, this dimension has a negative impact on the adoption of ITG in the public sector.

6.2.4 Lack of ICT strategy

According to Lowery (2001:3), ICT strategy is "fundamental to navigate through the exploding e-government marketplace, re-engineering processes and procedures to support e-government, and implementing e-government initiative." This means that it is essential to the development of strategic planning for ICT in government organisations in this digital generation. Previous studies have identified some of the challenges facing ITG in organisations that might be related to this dimension, such as the lack of organisational strategy and culture (Pereira & Mira da Silva, 2012), lack of regulatory environment (Othman et al., 2011), undefined roles and responsibilities (Othman et al., 2011, Latif et al., 2010), and lack of a clear ITG process (Lee et al., 2008).

It is important to establish a strategic alignment between the organisation's strategy and information technology strategy to achieve the IT value and goals of the organisation. ITGI (2007:6) defined strategic alignment as follows: "strategic alignment focuses on ensuring the linkage of business and IT plans; defining, maintaining and validating the IT value proposition; and aligning IT operations with enterprise operations."

In the Sultanate of Oman, which was the context for this study, the ITA is the body responsible for transforming Oman into a sustainable knowledge society (E-Oman) by activating ICT to enhance government services, enrich business and enable citizens to cope with E-Gov services (ITA, 2016).

The findings indicated a positive influence of this dimension: government agencies are now working rapidly to transform the electronic support from the ITA through a vision and action plan. Many of the institutions are now in the final stages of e-readiness, and some agencies are in a strong position in this regard despite the presence of financial and human challenges. ICT strategic plans are made separately for each organisation but must be aligned with the e-Oman strategy. The challenges of financial aspects and lack of resources might hinder the development of appropriate ICT plans, including short-term or long-term plans for IT innovations.

The strategy for IT governance in the Omani ICT strategy is a part of the digital transformation of government agencies. It is viewed as one of the priorities regarding standards and specifications for the application of the Omani government's readiness.

6.2.5 Organisation Characteristics

Organisational characteristics represent a significant dimension that impacts decision-making concerning the adoption of technology—including, particularly, ITG—in public sector organisations. Organisational characteristics can include the nature of the organisation, the services it provides, its size, its age and its structure. The challenges of ITG adoption related to this dimension, such as organisational structure and size (Pereira & Mira da Silva, 2012), organisational politics (Othman et al., 2011; Othman & Chan, 2013), organisational IT structure (Ali & Green, 2007)

and organisation type and size (Othman, 2016), have been identified as important by previous studies.

The findings (see sections 5.4.1 and 5.4.2) indicate that the characteristics of the organisation form a critical dimension that impacts the application of innovations according to the nature of the work of various organisations. For example, an organisation that offers services may be more likely to adopt technology than an office institution, largely due to the importance of the sectors in which it operates (e.g. education or health). Another factor is the size of an institution, including whether the organisation has one main office or several branches scattered throughout Oman, since this might impact the adoption of innovations.

Experience is also an important factor when comparing senior organisations and new organisations. For example, education and health institutions belong to older industries that provide essential services and may have more support than other industries. On the other hand, organisational structures in government institutions vary from one institution to another with regard to IT and dependence on top management. This may help such organisations plan for the future and establish decision-makers to facilitate critical decision-making processes, including those having to do with ICT.

6.2.6 Institutional theory in the institutional perspective

Institutional theory tends to be used in information systems research, especially at the institutional level in organisations. This study adds to the limited research into ITG and has helped to identify and understand the institutional dimensions that impact decision-making in the adoption of ITG in the public sector. Using the three main pillars of institutional theory, which are coercive, mimetic and normative, this

study has identified the institutional dimensions related to each pillar, as shown in Table 6.2. This offers a deep understanding of these dimensions at the institutional level of organisations and helps to form links with the individual perspective to achieve the purpose of the study.

6.3 Individual perspective discussion

Most of the extant studies have focused on ITG in general terms, such as structures, processes and mechanisms: few have focused on the behavioural dimensions and regulatory attention (Smits and Van Hillegersberg, 2015). This study looked at the individual side by developing knowledge of the impacts of individual and institutional dimensions in the adoption of IT governance.

This section discusses the findings from the individual dimension alongside previous studies to investigate and understand key individual behavioural intentions. Table 6.3 presents the findings based on the TPB Model.

TPB Model Pillars	Literature review (Seed categories)	Current study findings (Emerged categories)
Attitude (Behaviour Beliefs)	Relative Advantage Complexity	Positive with adoption ITG, Flexibility use of ITG Increased Transparency by ITG Usefulness of ITG, Good ideas for the adoption of ITG
Subjective Norms (Normative Beliefs)	Normative impacts	Training of ITG Knowledge of ITG Understanding of ITG Awareness of ITG
Perceived Behavioural Control (Control Beliefs)	Self-Efficacy Facilitating conditions	Organisation structure, IT department (follow) in organisation structure Reduce Organisation Process Lack of Resources, Human and non-human Facilitating conditions Self-efficacy Compatibility Motivation

Table 6.3 Findings based on TPB theory

This discussion of IT governance adoption in the public sector, based on the Theory of Planned Behaviour (TPB), examines the impacts of factors at the individual level of government organisations on the adoption of ITG.

6.3.1 Lack of Awareness

This empirical study underlines the importance of raising awareness on the uses of information technology within institutions and offering training programs in the use of new technologies at the individual level and encouragement to accept new technical innovations. The role of the ITA in this dimension is essential, especially in building modern innovations such as IT governance to promote e-Government.

In Oman, Act Government agencies now declaratively for the digital transformation forces to follow up on this transformation and raise awareness of the benefits of this work. More knowledge of the importance of technology is still needed to keep pace with technological advances in government services and the outreach of security, risks, controls and standards in the ICT arena.

6.3.2 Resistance to change

Resistance to change in government organisations can challenge attempts to develop programs to improve management. Efforts are needed to raise awareness of the importance of technology and to encourage and stimulate individuals' motivation in order to reduce their resistance and help them accept the use of technology in government institutions. Resistance to change has long been recognised as an important consideration in firms. It can be defined as the tendency of an individual to avoid making changes, dismiss the value of change and/or actively steer away from change (Oreg, 2003).

Research in management usually conceptualises resistance to change as any behaviour that seeks to maintain the existing organisational status quo (Del Val & Fuentes, 2003) or the persistent avoidance of change (Bovey & Hede, 2001). Alternatively, IT studies define resistance to change as a negative behaviour (Hirschheim & Newman, 1988) or an opposition to changes stemming from IS adoption (Markus, 1983). Resistance to change has been defined by Willson et al. (2009) as a notable obstacle facing ITG adoption. Similar definitions and descriptions have been provided by a number of other researchers (e.g. Zutshi & Sohal, 2004; Guasch et al., 2007; Pollard & Cater-Steel, 2009; Winniford et al., 2009).

Any new innovation tends to require change, which often manifests through alterations to organisational practices and routines. Formal ITG practices can produce significant changes in work processes or require departments to change how they operate. This may mean redundancies or changes in roles. Previous studies have shown that new innovations or technologies may create changes to organisational work practices and that adopters may face resistance to such changes. This has also been shown to be true in cases of ITG adoption (e.g. PwC & ITGI, 2007; Guasch et al., 2007; Bhattacharjya et al., 2008; Pollard & Cater-Steel, 2009; Willson et al., 2009; Winniford et al., 2009). Like the present study, all of these studies confirm that resistance to change is a significant barrier to the adoption of ITG. Such resistance could stem from a lack of awareness of the importance of ITG or a perception that new initiatives will increase employees' daily workloads. Therefore, we theorise that resistance to change will have a negative effect on the adoption of formal ITG practices.

In the context of the Omani public sector, there is still resistance to change in the pattern of work within public institutions, especially when adopting or applying

innovation. While young employees are eager to address new innovations, senior staff are satisfied with the traditional working methods, which may pose major institutional challenges. It is important to address this dimension to support the acceptance of new technologies in cases of appropriate plans for change. A willingness to accept change can be developed through awareness-raising, learning, training and working directly with innovations in application and practice. A further driver of resistance to change in the ITG domain could be a lack of awareness, since firms commonly believe that any new implementation could increase employees' daily workloads and burdens (Gartner, 2005). In sum, resistance to change has a negative impact on the adoption of ITG in public sector organisations.

6.3.3 Trust of Technology

Lack of confidence in adopting or using technical innovations is a serious obstacle that should be taken into consideration when attempting to implement new technology in public sector organisations. There is a notably weak electronic culture among users, with lack of trust in technology or innovations, concerns about information security, fear of not being able to protect databases from intrusion or sabotage, fear of disclosure of information by employees or beneficiaries of the system, fear of losing information or inaccuracies when performing updates to the administrative system and loss of confidence in the insurance programs and protection when performing administrative transactions.

An increase in trust can be fostered through participation in decision-making when adopting innovations, as well as support from leadership, the provision of an

atmosphere based on openness, ready availability of the necessary information, listening to the viewpoint of individuals and emphasizing personal responsibility.

6.3.4 Self-efficacy

Self-efficacy has been widely acknowledged as an important human factor that influences individuals' perceptions of technologies (Pavlou & Fygenson, 2006; Dillon & Lending, 2010; Aesaert & van Braak, 2014). It also plays a critical role in technology adoption decisions and has been used to understand users' attitudes toward specific technologies and innovations (King & Brown, 2004; Chan et al., 2005; Johnston & Warkentin, 2008; Teoh et al., 2013).

Self-efficiency is an important concept in explaining human behaviour, since it indicates an individual's ability to control his or her actions and works. An individual with a high sense of self-efficiency may be more efficient and more capable of facing challenges, making decisions and setting ambitious future goals. Conversely, a lack of self-efficiency is associated with depression, anxiety, helplessness, low self-esteem, and negative thoughts about one’s ability, achievements and personal growth.

6.3.5 Old Style Mindset

This section discusses the impact of traditional thinking on ITG adoption in the government institutions. The findings highlight the importance of changing the traditional mentality faced by institutions when making decisions, removing bureaucracy and increasing acceptance of modern innovations. To limit this phenomenon, there must be outreach and flexibility to simplify procedures to help

the organisation to achieve its goals. The fear of modern innovations in institutional knowledge hinders organisations' ability to keep pace with the adoption of new technology.

6.3.6 Social Networks

It is important to establish continued strong relations between the various departments in the organisation to ensure that the right decisions are made in the adoption of innovations. According to PwC and ITGI (2007), formal and informal relationships are an important element that impacts the adoption of ITG. A number of other studies agree on the importance of this dimension, such as Wilkin and Riddett (2009), Lee and Jeong (2008), the IT Governance Institute (2008b) and Zutshi and Sohal (2004).

The importance of interdepartmental cooperation within organisations helps them to achieve their goals. Teamwork contributes to the acceptance of modern systems through joint management and awareness among individuals, which is a responsibility of everyone. All of the various departments in an organisation should share initiatives with the IT department to develop and streamline the functioning of the organisation and apply the appropriate regulations. Consequently, this dimension has a negative impact on the adoption of IT governance in the public sector.

6.3.7 Migration of IT Specialists

The migration of IT professionals is a critical challenge for public sector organisations. Serious efforts are needed to retain IT professionals through training, support material, and moral motivation to stay in this area. The competition from the

private sector to absorb IT professionals by offering higher wages and perks threatens the public sector with a shortage of IT specialists. This Migration disrupts the work and resort to other parties such as IT companies.

6.3.8 TPB theory in the Individual perspective

In this study context, the government is now carefully considering this issue by supporting and motivating IT professionals through offering training, education, suitable wages, promotion opportunities and more advantages. Table 6.3 presents the elements of TPB findings.

TPB has helped in this study by identifying dimensions that impact the decision to apply IT governance. This theory is presented through its three dimensions (attitude, subjective norms and perceived behavioural control) by providing a set of individual dimensions at the level of individual behaviour with regard to intention to adopt IT innovation in government institutions. The dimensions that emerged also offer a positive extension to the TPB theory.

6.4 The synthesis of perspectives: discussion

This section discusses the integration between the two theories at multiple levels of the organisation in an attempt to answer the third research question by clarifying the impact of the synthesis of multiple dimensions in decisions about the adoption of IT governance. This integration suggests that there is a relationship between institutional and individual perspectives. It also confirms that the institutional theory can be linked with the Theory of Planned Behaviour (Kim, 2013).

Further, this research used secondary sources, such as government reports, digital transformation and the organisation's readiness, from the ITA, which is responsible for IT strategy in Oman. The organisations' websites and organisational structures were also used to obtain greater accuracy in the data by linking it with the preliminary data taken from the interviews. The secondary data helped acquire in-depth information to be synthesised into a clear plan for orderly data analysis.

6.4.1 Impact of institutional and individual perspectives

This study integrates institutional and individual levels, using institutional theory at the institutional level and the TPB at the individual level. The findings (see section 5.7) showed a close relationship between organisational and individual behaviour in the adoption of ITG. The organisational level is impacted by individuals through awareness, maturity of IT practice in determining priorities and the importance of modern technical innovations in the event that an individual has faith and maturity. Similarly, the individual level is impacted by the institution when there is a lack of material and moral motivation to support IT innovation, including actions that impede appropriate decisions. As a result, there are common elements at both levels that

influence the adoption of IT governance or any other IT innovation in public sector organisations.

6.4.2 Impacts of decision-making for ITG adoption:

Decision-making may have an impact by imposing internal and external restrictions to the adoption of an innovation. Internal impacts include the availability of financial resources, people's ability to take a proper decision, the flexibility of strategies as a policy authority, and resistance to change as a cultural issue. External impacts may include laws or government legislation, strong competition between public institutions, and issues of awareness of the adoption of modern technology innovation and its benefits for organisations.

This study is the first attempt to integrate institutional theory and TPB with regard to decision-making on the adoption of ITG in public sector organisations. This integration of these two theories helps to provide clear key institutional forces and behavioural intention to support the decision-making process for the adoption of IT governance. This study has focused on the integration of institutional pressures and individual intention-behaviour to identify and understand the impact of these dimensions on the adoption of IT governance in government institutions.

The study has also highlighted the institutional and individual dimensions and the extent of their direct and indirect impacts, and has helped to clarify these dimensions through the data collected and analyzed. Moreover, this study has found that the institutional dimensions through the three pillars of institutional theory as institutional forces were compatible for integration with the pillars of the TPB of beliefs as an intention-behaviour in public sector organisations.

This study contributes to multiple theories by highlighting the institutional powers and behavioural intention to adopt IT governance in government agencies. These theories play a major role in this study, as there are positive relations between all pillars of theories and there are no aspects that are not important. Behavioural intention played an active role when the institutional powers were positive and vice versa. The two cannot work separately: there must be integration of the institutional and individual perspectives for the adoption of technology in government institutions and particularly ITG governance.

6.5 The Model of IT Governance Adoption

The findings and outcomes of this study (see section 5.7) offer a dynamic model of decision-making for the adoption of ITG in public sector institutions. Figure 6.1 illustrates the institutional and individual dimensions that impact decision-making concerning the adoption of ITG in Omani public sector organisation.

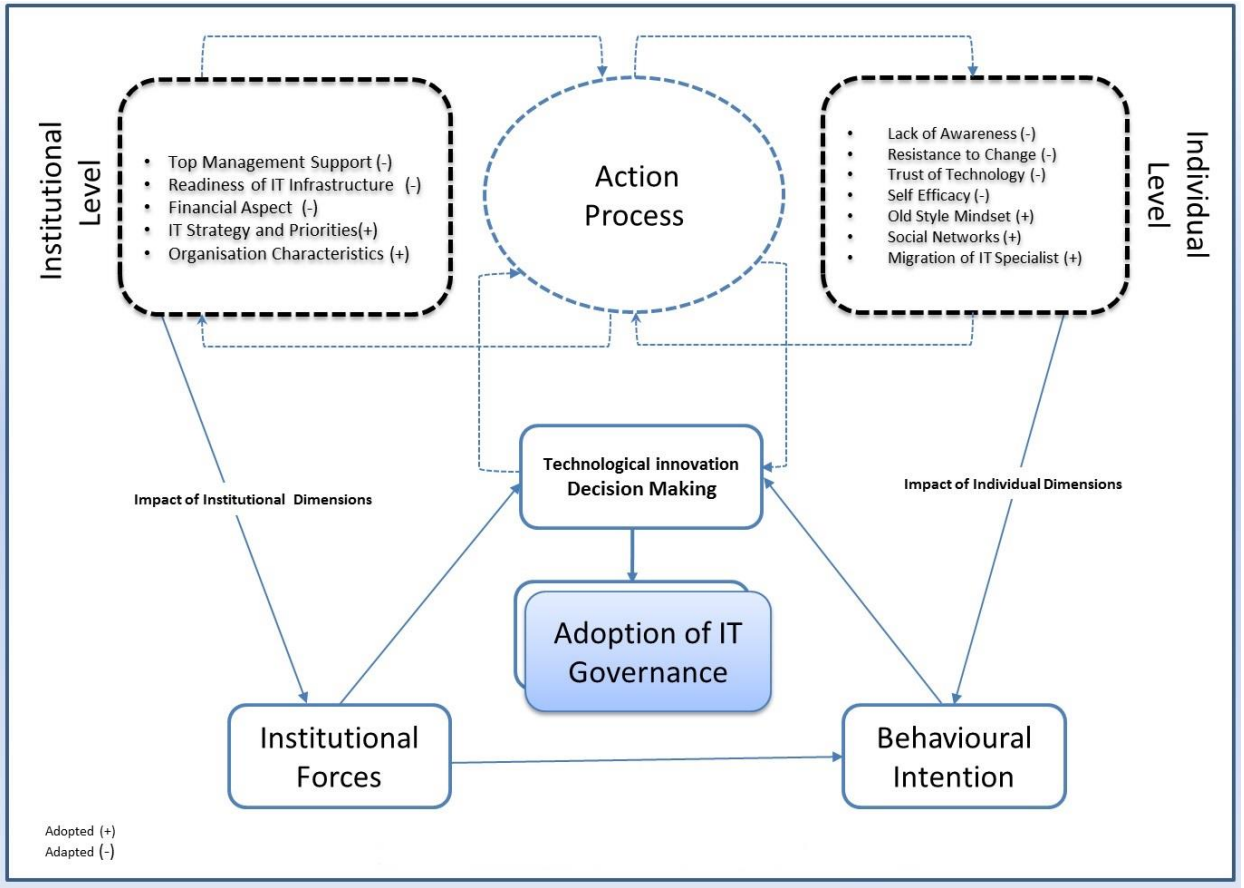

Figure 6.1 The Research Model of IT Governance Adoption in PSO

Figure 6.1 illustrates the mutual relationship between the individual and institutional levels, which escalates the relationship with the action process, as presented by the dashed lines running through the set of institutional and individual dimensions.

At the individual level, this study's findings concerning the impacts of ITG adoption include both dimensions identified by previous studies, indicated by a Adapted sign (-), and dimensions identified for the first time in this study, indicated by a Adopted sign (+). All of the identified dimensions impact the behavioural intentions of decision-makers in relation to their decisions to adopt ITG.

At the institutional level, the dimensions identified by this research, indicated by a Adopted sign (+), and the dimensions already identified by earlier studies, indicated by a Adapted sign (-), strongly impact decision-making related to behavioural intentions to adopt corporate ITG. The research has also identified the direct relationships between institutional forces and behavioural intentions.

In sum, the research findings indicate how IT innovation-related decision-making, such as decisions concerning ITG, are impacted by all dimensions presented in figure 6.1. Furthermore, the research shows how, together, the individual and institutional dimensions impact the adoption of ITG in Omani public sector organisations.

6.6 Chapter Conclusion

In summary, this chapter has discussed the study findings in relation to the literature with a focus on the adoption of ITG in the public sector. It has discussed the significance of taking into consideration the dimensions identified by this study and the extent of the direct relationship between the multiple levels emphasised in the

study. Moreover, it supports the findings of some previous studies but contradicts other, perhaps due to nature of the study, the study site, or methodological and other differences.

This research used secondary sources, such as government reports, digital transformation and the organisation's readiness, from the ITA, which is responsible for IT strategy in Oman. The organisations' websites and organisational structures were also used to obtain greater accuracy in the data by linking it with the preliminary data taken from the interviews. The secondary data helped acquire in-depth information to be synthesised into a clear plan for orderly data analysis.

The findings suggest that human behaviour dimensions have more impact than physical dimensions to achieve user satisfaction and acceptance of innovations. This is impacted by the behaviour of individuals, moral incentives and community relations, which are among the dimensions impacting individual behaviour and productivity.

The next chapter provides the conclusion to the study and illustrates how its aim has been achieved, answers the research questions and summarises the overall findings through the proposed model. The implications of the study, its limitations, suggestions for future studies and recommendations will be presented.

Chapter 7: **Conclusion**

7.1 Introduction

This chapter presents the conclusion to this study, whose aim was “To investigate how institutional and individual dimensions impact decision-making in the public sector for the adoption of ITG.” It set out to identify and improve understanding of the dimensions that encourage the adoption of ITG in the public sector and to fulfil the research question: “What institutional and individual dimensions impact decision-making in the public sector for the adoption of IT governance and how?”

This study is one of the very few studies to investigate the adoption of ITG in the government sector in the Sultanate of Oman. The government sponsor of this study has provided support by granting access to these organisations. Government institutions have certain sensitive properties, so it is necessary to understand the problem from their particular point of view in order to find solutions and recommendations. The key dimensions that have been investigated in other countries may not work in this context of this study.

7.2 Summary of Key Research Findings:

The main conclusions of this study are based on the review of the literature and the empirical data drawn from the responses of participants in the Omani public sector via interviews. The key findings are listed as follows:

- The literature review chapter identified and provided an understanding of the ITG field and investigated the challenges to the adoption of innovations in general and in the public sector in particular. It thus helped to clarify the aim of this study and compare its findings with previous findings. (The key to understanding.)

- The findings on institutional dimensions identified the key forces that influence the adoption of ITG. Some of these pressures were more important than others: for example, the financial aspect, the readiness of IT infrastructure and top management support were more influential than IT strategy and organisations' characteristics in these findings.

(Types of Institutional Dimensions = answered sub- research question No.1)

- Top Management Support (-)
- Readiness of IT Infrastructure (-)
- Financial Aspects (-)
- IT Strategy and Priorities (+)
- Organisation Characteristics (+)

These types of institutional dimensions are ranked as having the greatest impact on decision-making for the adoption of ITG in the public sector in the Omani context. These dimensions are discussed in relation to previous studies, and are considered to be priorities when making decisions to adopt IT innovations such as ITG. Some of the dimensions found in previous studies are referred to as Adapted (-), and the others, which are contributions of this study, are referred to as Adopted (+).

- The findings on individual dimensions indicate that behavioural intentions impact the adoption of ITG, such as lack of awareness, resistance to change; self-efficacy, old style mindset, social networks and migration of IT specialists.

(Key Individual dimensions = answered sub-research question No.2)

- Lack of Awareness (-)
- Resistance to Change (-)
- Trust of Technology (-)
- Self-Efficacy (-)
- Old Style Mind-set (+)
- Social Networks (+)
- Migration of IT Specialists (+)

These individual dimensions are probably ranked as the most important in influencing decision-making for ITG adoption in the Omani public sector. These dimensions are discussed in this study in relation to previous studies, and should be considered as priorities in decision-making regarding the adoption of IT innovations such as IT governance. Some of the dimensions are found in previous studies, and are referred to as Adapted (-), and the others are contributions of this study, and are referred to as Adopted (+).

- The combination of institutional and individual dimensions is an advantage in creating an environment of awareness of the importance of the adoption of IT innovations. This will contribute to the development of the public sector to

achieve competitive advantage and establish comprehensive e-services supported by IT innovations such as ITG.

(Integration of dimensions = answered research question No.3)

- The key success factors for ITG in the Omani public sector are presented in section 5.6: these should be considered by policymakers.
- The ITG challenges/issues mentioned in section 5.7 should be understood so that they can be resisted.

7.3 The contributions of the research

This section offers a list of contributions of this study to the body of knowledge in the field of information systems and ITG adoption in the public sector of Oman. The theoretical and practical contributions are stated below.

7.3.1 Theoretical Contributions

Table 7.1, below, sets out the theoretical contributions to the TPB and institutional theory.

<table>
<tr><th>Theoretical Model</th><th>Authors and example

(Previous studies in ITG and related areas)</th><th>Advancement and conclusion by findings of the present study</th></tr>
<tr><td rowspan="4">Theory of Planned Behaviour

(TPB)</td><td>Teo et al. (2013): A quantitative study was conducted among IT practitioners in Malaysia: attitudes do not have a significant relationship with participation in IT governance initiatives, in contrast to the prediction of the theory.</td><td rowspan="5">Referring to the previous studies (left mentioned) it’s used the theory of planned behaviour on the subject of IT governance and related, This study theoretical contributions on the different findings of their research in the following:

• This study adopted a qualitative approach to the adoption of IT governance, as recommended by Ifinedo (2012).

TPB use and findings in this study:

• The study is the first to focus on the adoption of ITG in the public sector by taking a qualitative approach using the theory of planned behaviour, and differs from the various quantitative studies of private sector organisations.</td></tr>
<tr><td>Ifinedo (2012) integrated TPB with PMT, using a survey of business managers in compliance with information security policies (ISP). This study recommended future research using qualitative studies, such as our study. The two constituents of subjective norms and attitude toward compliance from TPB were found to have significant positive relationships with a compliance of ISP.</td></tr>
<tr><td>Leonard et al. (2004): The findings of the study show that some dimensions are consistently significant in affecting attitude and behavioural intention. Other dimensions are important only in certain scenarios.</td></tr>
<tr><td>Burcu et al. (2010) Attitude plays a key role in explaining the relationships between assessment beliefs and intention as well as between ISA and intention, based on data collected from employees.</td></tr>
<tr><td>Institutional</td><td>Jewer and McKay (2012): IT Governance at the board level, industry sectors, mixed</td></tr>
</table>

Theory **(IS Theory)**	method. This study supports the integration of strategic choice and institutional theories to explain the antecedents to board IT governance and its consequences, as together they provide a more holistic framework with which to view board IT governance.	• The findings of our study are different in all Pillars of TPB which all pillars an importance not just some of them, agreeing with the study on the importance of the position. For example; study of Teo et al. (2013) found the attitudes not significant and study of Ifinedo (2012) found attiude and subjective norms only significant)
	Jacobson (2009): Revisiting IT Governance in the Light of Institutional Theory, focused on effective IT governance, proposed a revaluation of IT governance to gain a complete picture of the phenomenon.	
	Boubaker and Nyrhinen (2008): This study uses the institutional theory as a lens for explaining the choice of IT governance modes in organisations. A conceptual framework is then developed, and several hypotheses are presented. The framework considers the IT governance models from a non-rational perspective. It posits that coercive, normative, and mimetic pressures have an impact on the choice of IT governance models.	**Institutional theory use and finidings in this study:** • Used a qualitative approach to ITG adoption at institutional level. • All three pillars of IS theory in this study are significant to the adoption of ITG. • Subjective norm of TPB theory may link with the normative pillar in IS Theory.
	Other studies used the institutional theory in the adoption of ITG practices in the context of SMEs (MacGregor, 2004; Mohnnak, 2007; Islamoglu & Liebenau, 2007; Raymond et al., 2012)	

Integration of TPB and Institutional Ttheories	Most of the studies in IT governance applied one theory only. For examples : (Teo et al. (2013) in TPB and Jewer and McKay (2012) in IS Theory) Most studies were quantitative (see all studies mentioned in this table 7.1)	• First in the field of ITG. (integrations) • First to take a multi-level (institutional and individual) approach to ITG in public sector organisations. • First qualitative study and in the study context.

Table 7.1 The Theoretical Contributions of this study

Table 7.1, above, demonstrates the integration of institutional theory and TPB to support the understanding of the value of IT innovations and help policymakers to implement the adoption of ITG in the public sector.

7.3.2 Contributions in practice

1. Through the public sector context of Oman, these general findings contribute to the extension of knowledge in the area of adoption of information technology governance in the public sector.

2. A review of the literature has identified the dimensions that may impact the adoption of information technology governance in the public sector. This comprehensive review enriches the knowledge in this field and explains the dimensions included in this investigation.

3. The investigation sets out to understand the dimensions that impact and challenge the adoption of ITG, as identified in Chapter 1.

4. The conceptual framework presented in Chapter 3 provides a better understanding of the dimensions that impact the adoption of ITG based on

multiple theories. This framework is the theoretical foundation for the interview phase of the study.

5. The proposed model was analysed and the findings are discussed in Chapters 5 and 6, to develop a final model to enrich the understanding of the adoption of ITG in public sector organisations.

6. The dimensions involved in ITG adoption can be classified, as described in Chapter 7. The model classifies issues that may impact the adoption of governance of IT into two themes: organisational and individual context, and explores the boundaries of all the possible dimensions that may affect the adoption of ITG.

7. External impacts and pressures in the environmental context are investigated to determine possible dimensions that may impact adoption in the context of direct and indirect benefits of using information technology governance. After analysing the findings from Chapters 5 and 6, some new dimensions were discovered and added to this model.

8. The study has developed a roadmap to guide the decision-making process of governmental institutions in fostering the adoption of ITG in an efficient manner, as described in Chapter 7.

9. This contribution will help to bridge the gap between theory and practice, as the Government sector urgently needs such a roadmap process. Government organisations need easy, step-by-step solutions. The proposed roadmap will help organisations to move to ITG more quickly and confidently.

7.4 Limitations of study

Although this research has contributed to the understanding of ITG adoption and the impacts dimensions of decisions making in the public sector organisations, it has some limitations:

- One of the main limitations of the study is that it was based on the qualitative interview method, which may restrict the generalization of the findings. This limitation offers an opportunity to conduct a quantitative study using a survey to test the model developed in this study.

- This study's model of ITG adoption is validated only by participants' perceptions and experiences in government organisations. It has not been tested and it may not be transferable to other sectors.

The next section suggests some further studies, regarding the above limitations as opportunities for further research into the adoption of ITG in public sector organisations.

7.5 Further studies

This study could be supplemented and upgraded through a set of recommendations for future studies as follows:

- An action research study could be conducted to verify the model during the adoption of ITG in public sector organisations.

- The use of mixed methods of research may help to achieve greater credibility of findings compared to a single research method.

- Moreover, this study was limited to the pre-implementation (adoption) of ITG. Future studies could be conducted at different stages of implementation and post-implementation of ITG in the public sector.

7.6 Chapter Conclusion

This chapter has presented the conclusion to this thesis by offering the key findings, contributions of the research, and study limitations, as well as suggestions for future studies. It was the aim of this empirical study to understand and identify the institutional and individual dimensions that impact the decision to adopt ITG in public sector organisations. The research was guided by two theories, namely Institutional Theory and the Theory of Planned Behaviour, which were integrated to help answer the main research question.

The findings were collected from thirty-two IT directors in public sector organisations. This study is consistent with previous studies' findings and also presents some new dimensions that impact the decision to adopt ITG. It also provides a set of critical success factors and barriers to the adoption of innovations in general and ITG in particular.

Additionally, this research has contributed to the development of a conceptual framework that enhances the current knowledge of IT governance and information system research by clarifying a detailed description of the institutional and individual factors that must be considered when adopting ITG. This study is important for public-sector organisations, information systems researchers, the practitioners and those supporting the adoption of IT governance, providing them with a more in-depth understanding of the factors hindering ITG adoption.

In this regard, both theoretical and practical contributions were made for creating a model for ITG adoption in public-sector organisations, providing specialists, practitioners and senior management clear guidelines that can be used during ITG adoption.

Likewise, the lack of understanding of the importance of IT governance and the benefits of this innovation remains a challenge. More effort is required to improve awareness of the importance of IT innovations in government organisations. The findings of this research contribute to the adoption of IT innovations within government organisations and might influence the decision to adopt ITG.

Lastly, the model of this research will help better understand ITG adoption and use in Omani public institutions, and exploring the different institutional and individual dimensions has helped better understand the practical implications of ITG in public-sector organisations. Particularly, this research's findings can be generalised within the context of GCC countries, since they share similar cultures and histories with Oman, as well as within the context of developing countries.

References

Agafonoff, N. (2006), ―Adapting ethnographic research methods to ad hoc commercial market research‖, Qualitative Market Research: An International Journal. Vol. 9, No.2, pp 115-125.

Agarwal, R., Sambamurthy, V., and Stair, R.M. (2000), "Research report: The evolving relationship between general and specific computer self-efficacy - An empirical assessment," Information Systems Research (11:4), pp. 418-430.

Aguilar-Saven, R. S. (2004). Business process modelling: Review and framework. International Journal of production economics, 90(2), 129-149.

Ajzen, I. (1991). "The Theory of Planned Behavior," Organisational Behavior and Human Decision Processes 52(2), 179-211.

Ajzen, I. (2002). "Perceived behavioral control, self-efficacy, the locus of control, and the theory of planned behavior," Journal of Applied Social Psychology (32:4), pp 665-683.

Ajzen, I. and Fishbein, M. (1980). Understanding Attitudes and Predicting Social Behavior., Englewood Cliffs, NJ: Prentice Hall.

Al-Azri, A., Al-Salti, Z., & Al-Karaghouli, W. (2010). The successful implementation of e-government transformation: A case study in Oman. EMCIS2010, 2010, 12-13.

Al-Busaidy, M., & El-Haddadeh, R. (2011). Evaluating E-governemnt implementation using an institutional perspective: A case study of Oman. ECIS.

Ali, S. & Green, P. (2005). Determinants of effective information technology governance: A study of IT intensity. In Proceedings of IT Governance International Conference. Auckland, New Zealand, 15–26.

Ali, S. & Green, P. (2007). Effective IT Governance mechanisms in public sectors: an Australian Context. International Journal of Global Information Management (JGIM), 15(4), 41–63. Online: Available at

https://muhariefeffendi.files.wordpress.com/2007/12/good-governance-in-the-public-sector-cipfa-ifac-2013.pdf

Ali, S. & Green, P. (2009). "Effective information technology (IT) governance mechanisms: An IT outsourcing perspective," Information Systems Frontiers.

Al-Mamari, Q., Corbitt, B., & Gekara, V. O. (2013). E-government adoption in Oman: motivating factors from a government perspective. Transforming Government: People, Process and Policy, 7(2), 199-224.

AlRahbi, Talal, 2011. Digital Oman Strategy and e-Government (e- Oman), Sultanate of Oman, ITA, Presented on 21 June 2011.

Andrew, L. and Boyle, M.V. (2008), —Consumers' accounts of perceived risk online and the influence of communication sources‖, Qualitative Market Research: An International Journal, Vol. 11, No.1, pp 59-75.

Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behaviour: A met analytic review. British journal of social psychology, 40(4), 471-499.

Ashrafi, Rafi, Murtaza, Muhammed, 2008. Use and Impact of ICT on SMEs in Oman. Electron. J. Inf. Syst. Eval. 11 (3), 125.

Au, Kai-ming & Enderwick, P. (2000). A cognitive model on attitude towards technology adoption. Journal of Managerial Psychology, 15(4), 266-282.

Azam, A., Qiang, F., & Abdullah, M. I. (2013). Determinants of e-government services adoption in Pakistan: an integrated model. Electronic Government: An International Journal, 10(2), 105-124.

Bakari, J.B. (2007). A holistic approach for managing ICT Security in non-commercial organisations: A case in a developing country. Doctoral Thesis, Stockholm University, Stockholm.

Bandura, A. (1986). Social Foundations of Thought and Action: A Social Cognitive Theory. Englewood Cliffs, NJ: Prentice-Hall.

Barlette, Y. & Fomin, V. V. (2008). Exploring the suitability of is security management standards for SMEs. Paper presented at the 41st Annual Hawaii International Conference on System Sciences (HICSS), Hawaii.

Barley, S. R. (1986). "Technology as an Occasion for Structuring: Evidence from Observations of CT Scanners and the Social Order of Radiology Departments," Administrative Science Quarterly 31(1), 78-108.

Basu, S. (2004). E- government and developing countries: an overview. International Review of Law, Computers & Technology, 18(1), 109-132.

Battilana, J. (2006). "Agency and institutions: The enabling role of individuals' social position," Organisation 13(5), 653-676.

Berente, N & Yoo, Y (2012, 'Institutional contradictions and loose coupling: Post implementation of NASA's enterprise information system', Information Systems Research, vol. 23, no. 2, pp. 376-96.

Bernroider, E. W. (2008). IT governance for enterprise resource planning supported by the DeLone–McLean model of information systems success. Information & Management, 45(5), 257-269.

Beynon-Davies, P. & Williams, D. M. (2003). The diffusion of information system development methods. Journal of Strategic Information System, 12, 29-46. doi:10.1016/S0963-8687(02)00033-1

Bhattacharjya, J. & Chang, V. (2008). Adoption and implementation of IT governance: Cases from Australian higher education. In Information Technology Governance and Service Management: Frameworks and Adaptations, 82-100. USA: Information Science Reference.

Bhattacharjya, J., & Chang, V. (2006). Adoption and implementation of IT governance: cases from Australian higher education. Paper presented at the 17th Australasian Conference on Information Systems, Adelaide.

Bhattacharjya, J., & Chang, V. (2008). Adoption and Implementation of IT Governance: Cases from Australian Higher Education Information Technology

Governance and Service Management: Frameworks and Adaptations (pp. 82-100). USA: Information Science Reference.

Bjorck, F. (2004). "Institutional theory: A new perspective for research into IS/IT security in organisations," Proceedings of the 37th Hawaii International Conference on System Sciences, Citeseer 2004, p. 190.

Bock, G. W., Zmud, R. W., Kim, Y. G., and Lee, J. N. (2005). "Behavioral intention formation in knowledge sharing: Examining the roles of extrinsic motivators, social-psychological forces, and organisational climate," MIS Quarterly Management Information Systems 29(1), pp 87-111.

Boubaker, K. B., & Nyrhinen, M. (2008). Explaining Organizations' IT Governance Modes Choice from the Institutional Perspective: A Theoretical Framework Development. In ECIS (pp. 2440-2451).

Bowen, P.L., Cheung, M. D. & Rohdeb, F.H. (2007). Enhancing IT governance practices: A model and case study of an organisation's efforts. International Journal of Accounting Information Systems, 8, 191–221.

Boyne, G. A. (2002). Public and Private Management: What's the Difference? Journal of Management Studies, 39(1), 97-122.

Braun, V. and Clarke, V. (2006) Using thematic analysis in psychology.Qualitative Research in Psychology, 3 (2). pp. 77-101. ISSN 1478-0887 Available from: http://eprints.uwe.ac.uk/11735

Brown, A. E. & Grant, G. G. (2005). Framing the frameworks: A review of IT governance research. Communications of the Association for Information Systems, 15, 696–712.

Brown, S.A., Massey, A.P., Montoya-Weiss, M.M., and Burkman, J.Y. (2002). "Do I really have to? User acceptance of mandated technology," European Journal of Information Systems (11:4), pp. 283-295.

Bryman, A. (2008). Of methods and methodology. Qualitative Research in Organizations and Management: An International Journal, 3(2), 159-168.

Buchwald, A., Urbach, N., & Ahlemann, F. (2014). Business value through controlled IT: Toward an integrated model of IT Governance success and its impact. Journal of Information Technology, 29(2), 128–147. doi:10.1057/jit.2014.3

Budros, Ar.t (2002), 'The mean and lean firm and downsizing: Causes of involuntary and voluntary downsizing strategies'. Sociological Forum 7/2: 307–342.

Bulgurcu, B., Cavusoglu, H. and Benbasat, I.(2010), 'Information security policy compliance: An empirical study of rationality-based beliefs and information security awareness,' MIS Quarterly, 34 (3), 523-548.

Burt, R. S. (1982). Toward a Structural Theory of Action: Network Models of Social Structure, Perception, and Action. New York: Academic Press.

Butler, D. (2010). The downside of recovery: The new business risk landscape in 2010. Management Today, 28(2), 60–62.

Butler, R. & Butler, M. (2010). Beyond King III: Assigning accountability for IT governance in South African enterprises. South African Journal of Business Management, 41(3), 33.

Campbell, B. (2009), "Genocide as Social Control," Sociological Theory, 27, 150–172. doi:10.1111/j.1467-9558.2009.01341.x

Campbell, J., McDonald, C., & Sethibe, T. (2010). Public and private sector IT Governance: Identifying contextual differences. Australasian Journal of Information Systems, 16(2), 5–18.

Caralli, R.A. (2004). The Critical Success Dimension method: Establishing a foundation for enterprise security management (CMU/SEI-2004-TR- 010). Software Engineering Institute, Carnegie Mellon University.

Carney, M., Gedajlovic, E., and Yang, X. H. (2009). "Varieties of Asian capitalism: Toward an institutional theory of Asian enterprise," Asia Pacific Journal of Management 26(3), 361-380.

Cater-Steel, A., Tan, W. G., & Toleman, M. (2009). Using institutionalism as a lens to examine ITIL adoption and diffusion. Paper presented at the 20th Australasian Conference on Information Systems (ACIS), Melbourne, Australia.

Chaffee, E.E. (1985). Three models of strategy. Academy of Management Review. 10, 89-98.

Chiasson, M. W. & Davidson, E. 2005. "Taking industry seriously in information systems research," MIS Quarterly (29(4), 591-605.

CIPFA & IFAC (2013). Good Governance in the Public Sector Consultation Draft for an International Framework. The Chartered Institute of Public Finance and Accountancy (CIPFA) and the International Federation of Accountants (IFAC).

Collins, J. and Hussey, R. (2003), Business Research: A Practical Guide for Undergraduate and Postgraduate Students, 2nd Edition, Palgrave Macmillan, New York, pp 46-76

Contento, I. R. (2011). Nutrition Education: Linking Research, Theory, and Practice. Sudbury, MA: Jones and Bartlett.

Creswell, J. (1998). Qualitative inquiry and research design: Choosing among five traditions, 2.

Creswell, J. (2009). Research design: Qualitative, quantitative, and mixed methods approaches. SAGE Publications, Incorporated.

Croteau, A.M. & Bergeron, F. (2009). “Interorganizational governance of information technology”, Proceedings of the 42nd Hawaii International Conference on System Sciences.

Davenport, T. H., Jarvenpaa, S. L., & Beers, M. C. (1996). Improving knowledge work processes. Sloan management review, 37(4), 53.

De Haes S. & Van Grembergen W. (2008). An exploratory study in to the design of an IT Governance minimum baseline through Delphi research. Communications of the Association of the Information Systems, 22(24), 443–458.

De Haes, S., & Van Grembergen, W. (2009). An Exploratory Study Into IT Governance Implementations and its Impact on Business/IT Alignment. Information Systems Management, 26(2), 123-137.

Dean, J.W. Jr. & Sharfman, M.P. (1993). Procedural rationality in the strategic decision making process. Journal of Management Studies. 30, 587-611.

Debreceny, R, and Gray, G. (2013). IT Governance and Process Maturity: A Multinational Field Study. Journal of Information Systems, 27(1): 157-188.

Debreceny, R. (2013). Research on IT Governance, Risk, and Value: Challenges and Opportunities. Journal of Information Systems, 27(1): 129-135. [Editorial]

Debreceny, R., & Gray, G. L. (2013). IT Governance and Process Maturity: A Multinational Field Study. Journal of Information Systems, 27(1), 157-188.

Deephouse, D. L. (1996). "Does isomorphism legitimate?" Academy of Management Journal 39(4), 1024-1039.

Dehning, B. & Richardson, V. J. (2002), Returns on Investments in Information Technology: A Research Synthesis. Journal of Information Systems, 16(1). Available at SSRN: https://ssrn.com/abstract=307839

DeLooff, L. A. (1996). IS outsourcing by public sector organisation. International Federation for Information Processing.

Deng, H. (2008). Towards objective benchmarking of electronic government: an inter-country analysis. Transforming Government: People, Process and Policy, 2(3), 162-176.

Deng, H. (2008). Towards objective benchmarking of electronic government: an inter-country analysis. Transforming Government: People, Process and Policy, 2(3), 162-176.

Denscombe, M. (2008). Communities of practice a research paradigm for the mixed methods approach. Journal of mixed methods research, 2(3), 270-283.

Denzin, N. K. (2005). Indians in the park. Qualitative research, 5(1), 9-33.

Denzin, N. K., & Lincoln, Y. S. (2005). Paradigms and perspectives in contention. The Sage handbook of qualitative research, 183-190.

DiCicco-Bloom, B. and Crabtree, B.F. (2006) 'The qualitative research interview', Medical education, 40(4), pp. 314-321.

Dickinger, A., Arami, M., and Meyer, D. (2008). "The role of perceived enjoyment and social norm in the adoption of technology with network externalities," European Journal of Information Systems 17(1), 4-11.

DiMaggio, P. J. and Powell, W. W. (1983). "The iron cage revisited: Institutional isomorphism and collective rationality in organisational fields," American Sociological Review 48(2), 147-160.

Dombrowski, L., Hayes, G. R., Mazmanian, M., & Voida, A. (2014). E-government intermediaries and the challenges of access and trust. ACM Transactions on Computer-Human Interaction, 21(2), 13.

Donahue, J. D. & JS Nye (2002). The problem of public jobs. JD Donahue, Market-based governance: Supply side, demand side, upside, and downside, 264-295.

Dutton, J.E. & Duncan, R.B. (1987). The influence of the strategic planning process on strategic change. Strategic Management Journal. 8, 103-116.

Dutton, J.E. (1993). Interpretations on automatic: a different view of strategic issue diagnosis. Journal of Management Studies. 30, 339-357.

Dyer, W. G., & Wilkins, A. L. (1991). Better stories, not better constructs, to generate better theory: A rejoinder to Eisenhardt. Academy of management review, 16(3), 613-619.

Easterby-Smith, M., Thorpe, R. and Jackson, P.R. (2008), Management Research, 3rd Edition, Sage Publications Ltd., London, pp 55-112.

Elpez, I. & Fink, D. (2006). Information systems success in the public sector: stakeholder' perspectives and emerging alignment model. Issues in Informing Science and Information Technology, 3, 219– 231

Esteves, J. (2004). Definition and analysis of critical success dimensions for ERP implementation projects. Unpublished doctoral thesis at the Universitat Politècnica de Catalunya, Barcelona.

Evans, D., & Yen, D. C. (2006). E-Government: Evolving relationship of citizens and government, domestic, and international development. Government Information Quarterly, 23(2), 207-235.

Farnham, D. & Horton, S. (1996). Managing public and private organisations. In Farnham, D. and Horton S. (Eds), Managing the New Public Services. London: Macmillan.

Fereday, J. and Muir-Cochrane, E. (2006), ―Demonstrating rigor using thematic analysis: a hybrid approach of inductive and deductive coding and theme development‖, International Journal of Qualitative Methods, Vol. 5, No.1, pp 1-11.

Fishbein, M. and Ajzen, I. (1975). Belief, Attitude, Intention, and Behavior. Reading, MA: Addison-Wesley.

Fomin, V. V., Kaunas, L., de Vries, H. J., & Barlette, Y. (2008). ISO/IEC 27001, Information systems security management standard: exploring the reasons for low adoption. Paper presented at the 3rd European Conference on Management Technology, Nice, France.

Fortune, J. & White, D. (2006). The framing of project critical success dimensions by a systems model, International Journal of Project Management, 24, 53– 65.

Frambach, R. & Schillewaert, N. (2002). Organisational innovation adoption: A multi-level framework of antecedents and opportunities for future research. Journal of Business Research, 55(2), 163-176.

Friedland, R. & Alford, R. R. (1991). "Bringing society back in practices, and institutional contradictions," in W. W. Powell and P. J. DiMaggio (eds.), The New Institutionalism in Organisational Analysis. Chicago: University of Chicago Press, 232-263.

ftp://public.dhe.ibm.com/common/ssi/ecm/en/cie03065usen/CIE03065

Gallagher, K.P. & Worrel, J.L. (2008). Organizing IT to promote agility. Information Technology Management, 9(1), 71-88.

Gamble, E John and Thompson A Arthur (2009). Essentials of Strategic management, McGraw-Hill, Irwin

Gartner (2013). Gartner Says Worldwide IT Spending on Pace to Reach $3.8 Trillion in 2013. Online: retrieved from http://www.gartner.com/newsroom/id/2394415

Garud, R., Jain, S., & Kumaraswamy, A. (2002). "Institutional entrepreneurship in the sponsorship of common technological standards: The case of Sun Microsystems and Java," Academy of Management Journal (45(1), 196-214.

Gbenle, I. T. (2013). An Examination of the Relationship between Information Technology Governance (ITG) and Leadership in Organisations. Doctoral dissertation: Capella University.

George, E., Chattopadhyay, P., Sitkin, S. B., and Barden, J. Q. (2006). "Cognitive underpinnings of institutional persistence and change: A framing perspective," Academy of Management Review 31(2), 347-365.

Gerke, L., & Ridley, G. (2009). Tailoring COBIT for Public Sector IT Audit: An Australian Case Study. In A. Cater-Steel (Ed.), Information Technology Governance and Service Management: Frameworks and Adaptations (pp. 101-124). New York: IGI Global.

Gerrard, M. (2010). Defining IT governance: The Gartner IT governance demand/supply model. Gartner ID G, 140091, 2010.

Gershon, P. (2009). Is world-class IT governance in the public sector an impossible dream? Presentation at the Oceania Computer Audit Control Society (CACS) Conference on Facing the Future, National Convention Centre, Canberra. ISACA, Rolling Meadows.

Gheorghe, M., Nastase, P., Boldeanu, D., & Ofelia, A. (2009). IT Governance in Romania: A case study. Global Economy Journal, 9(1), 1-13.

Gil-Garcia, J.R. & Pardo, T.A. (2005). E-government success dimensions: Mapping practical tools to theoretical foundations. Government Information Quarterly, 22 (2), 187–216.

Golafshani, N. (2003). Understanding reliability and validity in qualitative research. The qualitatiue report, 8(4), 597-607.

Gray, D. E. (2009).Doing Research in the Real World (2nd ed.). SAGE Publications.

Greenwood, R., and Suddaby, R. (2006). "Institutional entrepreneurship in mature fields: The big five accounting firms," Academy of Management Journal, 49(1), 27-48.

Greenwood, R., Oliver, C., Suddaby, R. and Sahlin-Andersson, K. (eds.) (2008). Handbook of Organisational Institutionalism. Thousand Oaks, CA: Sage Publications.

Grimshaw, D., and Miozzo, M. (2006). Institutional effects on the IT outsourcing market: Analysing clients, suppliers and staff transfer in Germany and the UK. Organisation Studies, 27(9), 1229-1259.

Guasch, J. L., Racine, J.-L., Garcia, I. S., & Diop, M. (2007). Quality Systems and Standards for a Competitive Edge. Washington D.C: World Bank Publications.

Guasch, J. L., Racine, J.-L., Garcia, I. S., & Diop, M. (2007). Quality Systems and Standards for a Competitive Edge. Washington D.C: World Bank Publications.

Guldentops, E. (2004). “Key success dimensions for implementing IT Governance. Let’s not wait for regulators to tell us what to do,” Information Systems Control Journal, 2, 22-24.

Guldentops, E., Van Grembergen, W. & De Haes, S. (2002). “Control and governance maturity survey: establishing a reference benchmark and a self-assessment tool,” Information Systems Control Journal, 6, 32–35.

Hart, S.L. (1992). An integrative framework for strategic making processes. Academy of Management Review. 17, 327-351.

Haveman, H. A. & Rao, H. (1997). "Structuring a theory of moral sentiments: Institutional and organisational coevolution in the early thrift industry," American Journal of Sociology (102:6) May, pp 1606-1651.

Haveman, H. A. (1993). "Follow the leader: mimetic isomorphism and entry into new markets," Administrative Science Quarterly (38:4) Dec, pp 593-627.

Heinrich, C. J. & Fournier, E. (2004). "Dimensions of publicness and performance in substance abuse treatment organisations," Journal of Policy Analysis and Management 23(1), 49-70.

Hekkala, R., Urquhart, C., Newman, M. & Heiskanen, A. (2010). "Understanding Governance Issues in an Inter- Organisational IS project," Proceedings of the 21st Australasian Conference on Information Systems.

Heugens, P. & Lander, M. (2009). "Structure! Agency! (and other quarrels): a meta-analysis of institutional theories of organisation," Academy of Management Journal 52(1), 61-85.

Hoch, D. & Payán, M. (2008). Establishing good IT governance in the public sector. Transforming Government. Germany: McKinsey and Company. Retrieved October 17, 2008, from http://www.mckinsey.de/downloads/publikation/transforming_government/2008/0803_TG_it_governance.pdf.

Hofer, C. W., & Schendel, D. (1978). Strategic Formulation: Analytical Concepts, St. Paul, MN: West.

Hogg, M.K. and Maclaran, P. (2008), —Rhetorical issues in writing interpretivist consumer research‖, Qualitative Market Research: An International Journal, Vol. 11, No.2, pp 130-146.

Holden, S. H., Norris, D. F., & Fletcher, P. D. (2003). Electronic government at the local level: Progress to date and future issues. Public Performance & Management Review, 325-344.

Howard, C. & Seth-Purdie, R. (2005). "Governance Issues for Public Sector Boards," Australian Journal of Public Administration, 64(3), 56-68.

Hsieh, P. J. (2015). Physicians' acceptance of electronic medical records exchange: An extension of the decomposed TPB model with institutional trust and perceived risk. International journal of medical informatics, 84(1), 1-14.

Hsu, C.-L., and Lin, J. C.-C. (2008). "Acceptance of blog usage: The roles of technology acceptance, social influence and knowledge sharing motivation," Information & Management 45(1), 65-74.

Hsu, M.-H., and Chiu, C.-M. (2004). "Predicting electronic service continuance with a decomposed theory of planned behavior," Behaviour & Information Technology 23(5), 359 - 373.

IBM (2009). The new voice of the CIO - Insights from the Global Chief Information Officer Study. Somers, NY: IBM Institute for Business Value.

Ifinedo, P. (2012), 'Understanding information systems security policy compliance: An integration of the theory of planned behavior and the protection motivation theory,' Computers & Security, 31 (1), 83-95.

Ifinedo, P. (2017). Using an Extended Theory of Planned Behavior to Study Nurses' Adoption of Healthcare Information Systems in Nova Scotia. International Journal of Technology Diffusion (IJTD), 8(1), 1-17.

Igbaria, M., Zinatelli, N., Cragg, P., & Cavaye, A. L. (1997). Personal computing acceptance factors in small firms: a structural equation model. MIS quarterly, 279-305.

ISACA (2012). Information systems audit and control association. ISACA. Retrieved from http://www.isaca.org/cobit/pages/default.aspx

Islamoglu, M., & Liebenau, J. (2007). "Information technology, transaction costs and governance structures: Integrating an institutional approach". Journal of Information Technology, 22(3), 275-283.

Islamoglu, M., & Liebenau, J. (2007). Information technology, transaction costs and governance structures: Integrating an institutional approach. Journal of Information Technology, 22(3), 275-283.

ISO, (2008). ISO/IEC standard (ISO/IEC 38500:2008) for corporate governance of Information Technology. Retrieved October 15, 2008, from http://www.iso.org/iso/pressrelease.htm?refid=Ref1135.

IT Governance Institute (2008). IT Governance Global Status Report - 2008. Retrieved November 21, 2009, from http://www.itgi.org.

ITA, 2014. Digital Society. [ONLINE] Available at: http://www.ita.gov.om/ITAPortal/Info/FAQ_ DigitalSociety.aspx. [Accessed 10 March 2015].

ITA. (2016). Information Technology Authority. [ONLINE] Available at: http://ita.gov.om/ITAPortal/ITA/default.aspx. [Accessed 12 April 2016].

Itakura, H. (2007), "IT governance: organizational capabilities' view", Proceedings of the Portland International Center for Management, Engineering and Technology, Portland, OR, August, pp. 911-15

ITGI & PwC. (2006). IT Governance in Practice. Insight from Leading CIOs. Retrieved May 3, 2008, from www.itgi.org.

ITGI (2003). Board briefing on IT governance (2nd ed.). Retrieved May 2, 2008 from www.itgi.org.

ITGI (2007). COBIT 4.1. IT Governance Institute. Retrieved May 2, 2008 from www.itgi.org.

ITGI, I. G. I. (2007), COBIT 4.1, United States of America.

Jewer, J., & McKay, K. N. (2012). Antecedents and consequences of board IT governance: Institutional and strategic choice perspectives. Journal of the Association for Information Systems, 13(7), 581.

Joffe, H. and Yardley, L. (2004) '4. Content and thematic analysis', Research methods for clinical and health psychology.California: Sage, , pp. 56-68.

Johnson, T., Adams, D., and Kim, J. S. (2010). "Mapping the perspectives of low-income parents in a children's college savings account program," Children and Youth Services Review 32(1), 129-136.

Jones, C., McCarthy, R., Halawi, L., & Mujtaba, B. (2010). Utilizing the technology acceptance model to assess the employee adoption of information systems security measures. Issues in Information Systems, 11(1), 9-16.

Jong, F., Van Hillegersberg, J., Van Eck, P., Van Der Kolk, F., & Jorissen, R. (2010). Governance of offshore IT outsourcing at shell global functions IT-BAM development and application of a governance framework to improve outsourcing relationships. In: W. van der Aalst, J. Mylopoulos, M. Rosemann, M. J. Shaw, C. Szyperski (Series Eds.), I. Oshri, & J. Kotlarsky (Vol. Eds.), Lecture notes in business information processing: Vol. 55. Global sourcing of information technology and business processes (pp. 119-150). Berlin: Springer.

Juiz, C., Guerrero, C., & Lera, I. (2014). Implementing good governance principles for the public sector in information technology governance frameworks. Open Journal of Accounting, 3(1), 9–27. doi:10.4236/ojacct.2014.31003

Kaplan, R. S. & Norton, D. P. (1992). The balanced scorecard: measures that drive performance. Harvard Business Review, January-February, 71–79. PMID: 10119714

Karokola, G., Yngstrom, L., & Kowalski, S. (2012). Secure e-government services: a comparative analysis of e-government maturity models for the developing regions-the need for security services. International Journal of Electronic Government Research, 8(1), 1-25.

Karunasena, K., & Deng, H. (2011). A revised framework for evaluating the public value of e-government. Proceedings of the 17th Pacific Asia Conference on Information Systems, July 9-12, Taiwan.

Karunasena, K., & Deng, H. (2012). Critical factors for evaluating the public value of e-government in Sri Lanka. Government Information Quarterly, 29(1), 76-84.

Karunasena, K., Deng, H., & Karunasena, A. (2011). Structural equation modeling for evaluating the public value of service delivery through e-government: a case study from Sri Lanka. Proceedings of the International Conference on Web Information Systems and Mining, September 24-25, China.

Kawalek, J.P. and Jayaratna, N. (2003),‖Benchmarking the process of interpretive research in information systems‖, Benchmarking an International Journal, Vol.10, No.4, pp 400-413.

Keeney, R. L. (1982). Decision analysis: an overview. Operations research, 30(5), 803-838.

Khalfan, A. & Gough, T. G. (2002). Comparative analysis between the public and private sectors on the IS/IT outsourcing practices in a developing country: a field study. Logistics Information Management, 15 (3), 212–223.

Kisfalvi, V., and Maguire, S. (2011). "On the nature of institutional entrepreneurs: Insights from the life of Rachel Carson," Journal of Management Inquiry 20(2), 152-177.

Kitto, S. C., Chesters, J., & Grbich, C. (2008). Quality in qualitative research. Medical journal of Australia, 188(4), 243.

Ko, D., & Fink, D. (2010). “Information technology governance: an evaluation of the theory-practice gap,” Corporate Governance: The International Journal of Business in Society, 10(5), 662-674.

Kolekofski Jr, K. E., & Heminger, A. R. (2003). "Beliefs and attitudes affecting intentions to share information in an organisational setting," Information and Management, (40(6), 521-532.

Krell, K., Matook, S., & Rohde, F. (2016). The impact of legitimacy-based motives on IS adoption success: An institutional theory perspective. Information & Management, 53(6), 683-697.

Krey, M., Keller, T., Harriehausen, B., & Knoll, M. (2011). Towards a classification of information technology governance framework for the development of an IT

GRC healthcare framework. In: Proceedings of the Consumer Communications and Networking Conference, CCNC, IEEE, Las Vegas, USA, pp. 34-38.

Kuan, K.K.Y. and Chau, P.Y.K. (2001) A perception-based model for edi adoption in small businesses using a technology-organization-environment framework, "Information & Management", Vol. 38, No. 8, pp 507-521.

Kuo, F. Y. & Young, M. L. (2008a). "Predicting knowledge sharing practices through intention: A test of competing models," Computers in Human Behavior, 24(6), 2697-2722.

Kuo, F. Y. & Young, M. L. (2008b). "A study of the intention - action gap in knowledge sharing practices," Journal of the American Society for Information Science and Technology (59(8), 1224-1237.

Kvale, S. & Brinkmann, S. (2009). Interviews: Learning the craft of qualitative research interviewing, London, SAGE Publications

Kvale, S. (2007). Doing Interviews, London, SAGE Publications

Lal Dey, B., Binsardi, B., Prendergast, R., & Saren, M. (2013). A qualitative enquiry into the appropriation of mobile telephony at the bottom of the pyramid. International Marketing Review, 30(4), 297-322.

Lam, A. (2010). "From 'Ivory Tower Traditionalists' to 'Entrepreneurial Scientists'? Academic Scientists in Fuzzy University-Industry Boundaries," Social Studies of Science 40(2), 307-340.

Lane, J. E. (1995). The public sector: concepts, models and approaches. London: Sage.

Latif, A. A., Din, M. M., & Ismail, R. (2010). Challenges in adopting and integrating ITIL and CMMi in ICT division of a public utility company. Paper presented at the Computer Engineering and Applications (ICCEA), 2010 Second International Conference on (Vol. 1,pp. 81-86). IEEE.

Latif, A. A., Din, M. M., & Ismail, R. (2010). Challenges in Adopting and Integrating ITIL and CMMi in ICT Division of a Public Utility Company. Paper presented at

the Second International Conference on Computer Engineering and Applications (ICCEA).

Lawry, R., Waddell, D. & Singh, M. (2007). Roles, Responsibilities and Futures of Chief Information Officers (CIOs) in the Public Sector. In Proceedings of European and Mediterranean Conference on Information Systems (EMCIS).

Lee, C.-H., Lee, J.-H., Park, J.-S., & Jeong, K.-Y. (2008). A study of the causal relationship between IT governance inhibitors and its success in Korea enterprises. Paper presented at the Hawaii International Conference on System Sciences, Proceedings of the 41st Annual.

Lee, J., Lee, C. & Jeong, K. (2008). "Governance inhibitors in IT strategy and management: An empirical study of Korean enterprises," Global Economic Review, 37(1), 1-22.

Lee, J., Lee, C., & Jeong, K. Y. (2008). Governance Inhibitors in IT Strategy and Management: An Empirical Study of Korean Enterprises. Global Economic Review, 37(1), 1-22.

Lee, Y., and Kozar, K. A. 2008. "An Empirical Investigation of Anti-Spyware Software Adoption: A Multi-theoretical Perspective," Information and Management (45:2), pp 109-119.

Lee, Y., and Kozar, K.A. 2005. "Investigating Factors Affecting Adoption of Anti - Spyware Systems," Communications of the ACM (48:8), pp 72-77.

Leih, M. J. (2009). Regulatory impact on IT governance: A multiple case study on the Sarbanes-Oxley Act. (Doctoral Dessertation), The Claremont Graduate University, Claremont, CL.

Liang, H., Saraf, N., Hu, Q., Xue, Y. (2007). Assimilation of enterprise systems: The effect of institutional pressures and the mediating role of top management. MIS Quarterly, 31(1), 59-87.

Lin, F., Chou, S., & Wang, W. K. (2011). "IS practitioners views on core factors of effective IT governance for Taiwan SMEs," International Journal of Technology Management, 54(2), 256-269.

Liu, Q., & Ridley, G. (2005). “IT Control in the Australian public sector: an international comparison,” Proceedings of the Thirteenth European Conference on Information Systems. Germany: Regensburg.

Loukis, E.N. & Tsouma, N. (2002). “Critical issues of information systems management in the Greek Public Sector,” Information Polity, 7 (1), 65–83.

Lowery, L. M. (2001). Developing a successful e-government strategy. San Francisco, Department of Telecommunications & Information Services.

Luftman, J., Dorociak, J., Kempaiah, R. and Rigoni, E.H. (2008), “Strategic alignment maturity: a structural equation model validation”, Proceedings of the Fourteenth Americas Conference on Information Systems, Toronto, Canada, August, pp. 1-16.

Lyles, M.A. & Thomas, H. (1988). Strategic problem formulation. Journal of Management Studies. 25, 131-146.

MacGregor, R. C. (2004). “Factors associated with formal networking in regional small business: Some findings from a study of Swedish SMEs”. Journal of Small Business and Enterprise Development, 11(1), 60-74.

MacGregor, R. C. (2004). Factors associated with formal networking in regional small business: Some findings from a study of Swedish SMEs. Journal of Small Business and Enterprise Development, 11(1), 60-74.

Mansourain, Y. (2006), ―Adoption of grounded theory in LIS research‖, New Library World, Vol.107, No.9/10, pp 386-402.

Manstead, A. S. R. & Van Eekelen, S. A. M. (1998). "Distinguishing between perceived behavioral control and self-efficacy in the domain of academic achievement intentions and behaviors," Journal of Applied Social Psychology 28(15), 1375-1392.

March, J.G. (1981). Decision-making perspectives. In Van De Ven, A.H. and W.F. Joyce. (eds). Perspectives on Organization Design and Behavior. N.Y: John Wiley and Sons.

Marks, L. (2011). Top IT Governance Issues of 2011. ISACA Journal (JOnline), 3, 1–5. Retrieved from http://www.isaca.org/Journal/Past-Issues/2011/Volume-3/Documents/jolv3-11-Top-IT-Gov.pdf

Mason, R.O. & Mitroff, I.I. (1981). Challenging Strategic Planning Assumptions. New York: Wiley.

Mayntz, R. (2003). New challenges to governance theory. Governance as social and political communication, 27-40.

Merhout, J.W. & Havelka, D. (2008). "Information Technology Auditing: A Value-Added IT Governance Partnership between IT Management and Audit," Communications of the Association for Information Systems, vol. 23, 463- 482.

Meyer, D. (2004). Systemic is Governance: An Introduction. Information Systems Management, 21(4), 23–34. doi:10.1201/1078/44705.21.4.20040901/84184.3

Meyer, J. W. & Rowan, B. (1977). 'Institutionalized organizations: Formal structure as myth and ceremony'. American Journal of Sociology, 83, 340-363.

Mignerat, M., and Rivard, S. (2009). Positioning the institutional perspective in information systems research, Journal of Information Technology. 24(4), 369–391.

Miles, M.B. and Huberman, A.M. (1994), An Expanded Sourcebook: Qualitative Data Analysis, 2nd Edition, Sage Publications Ltd. London, pp 1-8.

Mintzberg, H., Raisinghani, D., & Théorêt, A. (1976). The structure of unstructured decision processes. Administrative Science Quarterly, 21(2), 246-275.

Mohnnak, K. (2007). Innovation networks and capability building in the Australian high-technology SMEs. European Journal of Innovation Management, 10(2), 236-251.

MOI. (2016). Ministry of information. [ONLINE] Available at: http://www.omaninfo.om. [Accessed 25 September 2016].

Moore, M. (1995). Creating public value: strategic management in government. Cambridge, MA: Harvard University Press.

Myers, M. D. (2009). Qualitative Research in Business & Management. London: Sage.

Myers, M.D. and Newman, M. (2007) 'The qualitative interview in IS research: Examining the craft', Information and organization, 17(1), pp. 2-26.

Neustadt, R & May, E. (1986). Thinking In Time. N.Y: Free Press.

Nfuka, E. N. & Rusu, L. (2011). "The effect of critical success factors on IT governance performance". Industrial Management & Data Systems, 111(9), 1418-1448.

Nfuka, E.N. & Rusu, L. (2010). "Critical success dimensions for effective IT governance in the public sector organisations in a developing country: The case of Tanzania". In Trish, A., Turpin, M. & Van Deventer J.P. (Eds.), Proceedings of the 18th European Conference on Information Systems, University of Pretoria, 2010, AIS Electronic Library (AISeL), Atlanta, GA, pp. 1–15.

Nfuka, E.N., Rusu, L., Johannesson, P. & Mutagahywa, B. (2009). The state of IT governance in organisations from the public sector in a developing country. In Proceedings of the 42nd Hawaii International Conference on System Sciences in Hawaii, 2009. Computer Society Press. Los Alamitos, CA, pp. 1–12.

Nicoll, P. (2005). "What lies ahead for public sector governance?" Keeping Good Companies, 57, 19–26.

Nxele, S. & Maimbo, H. (2009). The factors that prevent successful implementation of information technology governance within South African Companies. ISACA dissertation competition. ISACA SA Chapter. Available at: http://www.isaca.org.za/page.

OECD (1999). OECD Principles of Corporate Governance, SG/CG(99).

OECD (2004). Principles of Corporate Governance. OECD. Available on <http://www.oecd.org/corporate/oecdprinciplesofcorporategovernance.htm>. Retrieved 2014-06-24.

Oliveira, T. and Martins, M.F. (2010) Firms patterns of e-business adoption: Evidence for the european union- 27, "The Electronic Journal Information Systems Evaluation Volume", Vol. 13, No. 1, pp 47-56.

Oliver, C. (1991). "Strategic responses to institutional processes," Academy of Management Review 16(1), 145-179.

Othman, M. F. I. (2016). Barriers to the adoption of formal IT governance practice: A Malaysian case. Queensland University of Technology, Australia. PhD thesis.

Othman, M. F. I., & Chan, T. (2013). Barriers to formal IT governance practice - insights from a qualitative study. Paper presented at the System Sciences (HICSS), 2013 46th Hawaii International Conference on.

Othman, M. F. I., Chan, T., Foo, E., Nelson, K. J., & Timbrell, G. T. (2011). Barriers to information technology governance adoption: a preliminary empirical investigation. Paper presented at the Proceedings of 15th International Business Information Management Association Conference.

Padmanabhan, G. (2012). Issues in IT Governance. In BIS Central Bankers' Speeches (pp. 1–8). Retrieved from http://www.bis.org/review/r120719b.pdf.

Palvia, S. C. J., & Sharma, S. S. (2007). E-government and e-governance: definitions/domain framework and status around the world. Proceedings of the International Conference on E-governance, December 10-13, Macau.

Pang, M.-S. (2014). IT governance and business value in the public sector organisations — The role of elected representatives in IT governance and its impact on IT value in U.S. state governments. Decision Support Systems, 59, 274–285.

Papadakis, V.M., Lioukas, S. & Chambers, D. (1998). Strategic decision-making processes: the role of management and context. Strategic Management Journal. 19, 115-147.

Parker, C.M., and Castelman, T. (2007) "New Directions for Research on SME-eBusiness: Insights from an Analysis of Journal Articles from 2003 to 2006", Journal of Information Systems and Small Business, Vol. 1, No. 1/2, pp. 21-40,.

Parker, M.M., Peterson, R.R. and Ribbers, M.A. (2002). Designing information technology governance processes: Diagnosing contemporary practices and competing theories.In System Sciences, 2002. HICSS. (PP.3143-3154).IEEE.

Parker, S. L. (2013). An Exploration of the Factors Influencing the Adoption of an IS Governance Framework. (Doctoral Dissertation), Nova Southeastern University, Florida, United States. ProQuest Dissertations & Theses Global database.

Paul, G.A. (1987). Quality Process Management. Englewood Cliffs, NJ: Prentice-Hall.

Pavlou, P. A., & Fygenson, M. (2006). "Understanding and predicting electronic commerce adoption: An extension of the theory of planned behaviour," MIS Quarterly: Management Information Systems, 30(1), 115-143.

Pavlou, P. A., & Fygenson, M. (2006). Understanding and predicting electronic commerce adoption: An extension of the theory of planned behavior. MIS quarterly, 115-143.

Pearce, J.A. II & Robinson, R.B. Jr. (1994). Strategic Management, Formulation, Implementation, and Control, 5th ed. Burr Ridge, Illinois: Irwin inc.

Peizer, J. (2003). Cross-sector information and communications technology funding for development: What works, what does not, and why. Information Technologies and International Development 1(2), 81–88.

Pereira, R. & Mira da Silva, M. (2012). A literature review: Guidelines and contingency factors for IT governance. Paper presented at the 16th IEEE International EDOC, Conference on Enterprise Distributed Object Computing.

Pereira, R., and Mira da Silva, M. (2012). Designing a new integrated IT Governance and IT management framework based on both scientific and practitioner viewpoint. International Journal of Enterprise Information Systems, 8(4), 1-43.

Perkins, W.S. & Rao, R. (1990). The role of experience in information use and decision making by marketing managers. Journal of Marketing Research, 27(1), 1-10.

Perry, J. L. & Rainey, H. G. (1988). “The public-private distinction in organisation theory: A critique and research strategy”. Academy of Management Review, 13(2), 182-201.

Pervan, G., Bajwa, D., & Floyd Lewis, L. (2005). A study of the adoption and utilization of seven collaboration technologies in large organizations in Australia and New Zealand. Journal of Global Information Technology Management, 8(2), 5-26.

Peshkin, A. (1993), ―The Goodness of Qualitative Research‖, Educational Researcher, Vol. 22, No.2, pp 23-29.

Peterson R. (2004). “Information Strategies and Tactics for Information Technology Governance,” in W. Van Grembergen (Ed.), Strategies for Information Technology Governance, Idea Group Publishing.

Phillips, N. and Tracey, P. (2007). "Opportunity recognition, entrepreneurial capabilities and bricolage: connecting institutional theory and entrepreneurship in strategic organisation," Strategic Organisation, 5(3), 313-320.

Polit, D. F., & Beck, C. T. (2010). Generalization in quantitative and qualitative research: Myths and strategies. International journal of nursing studies, 47(11), 1451-1458.

Pollard, C., & Cater-Steel, A. (2009). Justifications, Strategies, and Critical Success Factors in Successful ITIL Implementations in U.S. and Australian Companies: An Exploratory Study. Information Systems Management, 26(2), 164 - 175.

Pollock, N., and Williams, R. (2008). Software and organisations: The biography of the enterprise-wide system or how SAP conquered the world. New York: Routledge.

Pope, C., Ziebland, S. and Mays, N. (2000) 'Qualitative research in health care. Analysing qualitative data', BMJ (Clinical research ed.), 320(7227), pp. 114-116.

Posthumus, S., Von Solms, R., & King, M. (2010). The board and IT governance: The what, who and how. South African Journal of Business Management, 41(3), 23-32.

Potter, J., & Wetherell, M. (1987). Discourse and social psychology: Beyond attitudes and behaviour. Sage.

Powell, W. W., & Colyvas, J. A. (2008). "Microfoundations of institutional theory," in, C. O. Greenwood, R. Suddaby and K. Sahlin (Eds.), The Sage handbook of organisational institutionalism. Thousand Oaks, CA: Sage.

Preittigun, A., Chantatub, W., & Vatanasakdakul, S. (2012). A Comparison between IT governance research and concepts in COBIT 5. International Journal of Research in Management & Technology, 2(6), 581-590.

Punch, K. F. (2013). Introduction to social research: Quantitative and qualitative approaches. Sage.

PwC & ITGI. (2007). New Thought Leadership on IT Governance in Practice: Insight from Leading CIOs. Retrieved December 6, 2009, from http://www.isaca.org/

Rajagopolan, N., Rasheed, A.M.A.& Datta, D.K. (1993). Strategic Decision Processes: Critical Review and Future Directions. Journal of Management. 2, 349-384.

Rana, N., Lal, B., & Slade, E. (2016). Adoption of Two Indian E-Government Systems: Validation of Extended Theory of Planned Behavior (TPB). Twenty-second Americas Conference on Information Systems, San Diego, 2016

Rau, K. G. (2004). Effective governance of IT: Design objectives, roles, and relationships. Information Systems Management, 21(4), 35–42. doi:10.1201/1078/44705.21.4.20040901/84185.4

Raymond, L., Uwizeyemungu, S., Bergeron, F., & Gauvin, S. (2012). “A framework for research on e-learning assimilation in SMEs: A strategic perspective”. European Journal of Training and Development, 36(6), 592-613.

Raymond, L., Uwizeyemungu, S., Bergeron, F., & Gauvin, S. (2012). A framework for research on e-learning assimilation in SMEs: A strategic perspective. European Journal of Training and Development, 36(6), 592-613.

Ribbers, P.M.A., Peterson, R.R. & Parker, M.M. (2002). Designing IT governance processes: Diagnosing contemporary practices and competing theories. In Proceedings of the 35th Hawaii International Conference on System Sciences, IEEE Computer Society.

Ring, P. S. & Perry, J. L. (1985). “Strategic Management in Public and Private Organisations: Implications of Distinctive Contexts and Constraints.” Academy of Management Review, 10(2), 276-286.

Robinson, K. J. (2011). "The Rise of Choice in the US University and College: 1910-2005," Sociological Forum, 26(3), 601-622.

Robson, G. S., Wholey, D. R., & Barefield, R. M. (1996). "Institutional determinants of individual mobility: Bringing the professions back in," Academy of Management Journal, 39(2), 397-420.

Rockart, J. & Van Bullen, C. (1986). “A primer on critical success dimensions.” In Rockart, J. and Van Bullen, C. (Ed.). The Rise of Management Computing. Homewood: Irwin.

Rockart, J. and Van Bullen, C. (1986). A Primer on Critical Success Factors. In Rockart, J. and Van Bullen, C. (Ed.), The Rise of Management Computing. Homewood: Irwin.

Rogers, E. (1995). Diffusion of Innovations. (4th ed.). New York, NY: The Free Press.

Rollinson, D. (2008). Organisational behaviour and analysis: an integrated approach. Pearson Education.

Roth, N. R., Sitkin, S. B., & House, A. (1994). "Stigma as a Determinant of Legalization," in S. B. Sitkin and R. J. Bies (eds.), The Legalistic Organisation. Newbury Park, CA: Sage, pp. 137-168.

Rowlands, B., Haes, S. D., & Grembergen, W. V. (2014). Exploring and Developing an IT Governance Culture Framework. Proceedings of the Thirty-Fifth International Conference on Information Systems, Auckland.

Rowley, J. (2012) 'Conducting research interviews', Management Research Review, 35(3/4), pp. 260-271.

Rubino, M., & Vitolla, F. (2014). Corporate governance and the information system: how a framework for IT governance supports ERM. Corporate Governance, 14(3), 320-338.

Rupidara, N. S., & McGraw, P. (2011). "The role of actors in configuring HR systems within multinational subsidiaries," Human Resource Management Review, 21(3), 174-185.

Ryu, S., Ho, S. H., & Han, I. (2003). "Knowledge sharing behavior of physicians in hospitals," Expert Systems with Applications 25(1), 113-122.

Safa, N.S., Sookhak, M., Solms, R.V., Furnell, S., Abdul-Ghani, N., and Herawam, T. 2015. “Information Security Conscious Care Behaviour Formation in Organisations,” Computers and Security (53) pp 65-78.

Salem, F. (2012) 'Social Media, Employment and Entrepreneurship: New Frontiers for the Economic Empowerment of Arab Youth', Employment and Entrepreneurship: New Frontiers for the Economic Empowerment of Arab Youth (October 3, 2012), .

Sambamurthy, V. & Zmud, R.W. (1999), ‘Arrangements For Information Technology Governance: A Theory Of Multiple Contingencies’, MIS Quarterly, vol.23, no.2, pp. 261-290.

Santiso, C. (2001). World Bank and good governance: good governance and aid effectiveness: the World Bank and conditionality. Geo. Public Pol'y Rev., 7, 1-137.

Saraf, N., Liang, H., Xue, Y., and Hu, Q. (2013). How does organisational absorptive capacity matter in the assimilation of enterprise information systems?, Information Systems Journal, 23(3), 245-267.

Saxena, K.B.C. (1996) “Reengineering Public Administration in Developing Countries”. Long Range Planning, 29, (5), 704-712.

Schultze, U. and Avital, M. (2011) 'Designing interviews to generate rich data for information systems research', Information and Organization, 21(1), pp. 1-16.

Schwab, K. (2015) 'World Economic Forum’s Global Competitiveness Report, 2014-2015', Retrieved from http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2014-15.pdf.

Schware, R. and Deane, A. (2003), “Deploying e-government programs: the strategic importance of ‘I’ before ‘E’”, info, 5, 4, pp. 10-19.

Schwarz, A. & Hirschheim, R. (2003). An extended platform logic perspective of IT governance: managing perceptions and activities of IT. The Journal of Strategic Information Systems, 12(2), 129–166.

Schwenk, C. R. (1988). The cognitive perspective on strategic decision making. Journal of management studies, 25(1), 41-55.

Schwenk, G. (1990). Conflict in organisational decision making: An exploratory study of its effects in for-profit and not-for-profit organisations. Management Science, 26 (4): 436–48.

Scott, R. W. (2001). Institutions and Organisations (2nd Ed.)Thousand Oaks, CA: Sage.

Scott, W. R. (1995). Institutions and Organisation. Thousand Oaks, CA: Sage.

Scott, W. R. (2004). "Institutional Theory: Contributing to a Theoretical Research Program," in, K. G. Smith and M. A. Hitt (eds.), Great Minds in Management. New York: Oxford University Press, pp. 460-484.

Scott, W. R. (2007). Institutions and organisations: Ideas and interests. Thousand Oaks, CA: Sage.

Sedera, W., Gable, G., Rosemann, M., & Smyth, R. (2004). A success model for business process modeling: Findings from a multiple case study. Pacific Asia Conference on Information Systems (PACIS), 38.

Sethibe, T., Campbell, J. & McDonald, C. (2007). IT Governance in Public and Private Sector Organisations: Examining the Differences and Defining Future Research Directions. In Proceedings of 18th Australasian Conference on Information Systems (ACIS).

Sethibe, T., Campbell, J. & McDonald, C. (2007). IT governance in public and private sector organisations: Examining the differences and defining future research directions. In Proceedings of 18th Australasian Conference on Information Systems (ACIS).

Shaikh, G.Y., Marri, H.B., Shaikh, N. R., Shaikh, A.A. & Humbhati, K. K. (2007). Impact of Information Systems on the performance and improvement of an Enterprises Source. In Proceedings of European and Mediterranean Conference on Information Systems (EMCIS).

Shaikh, G.Y., Marri, H.B., Shaikh, N. R., Shaikh, A.A. & Humbhati, K. K. (2007). Impact of Information Systems on the performance and improvement of an Enterprises Source. In Proceedings of European and Mediterranean Conference on Information Systems (EMCIS).

Shaw, R. S., Cheng, C. P., Fu, T. Y., Tsai, C. W., & Yen, D. C. (2014). The Relationship between Information Technology Governance and Information Technology Performance in Taiwanese Financial Enterprises. International Journal of Innovation in the Digital Economy (IJIDE), 5(3), 17-31.

Sherer, S. A., Meyerhoefer, C. D., & Peng, L. (2016). Applying institutional theory to the adoption of electronic health records in the US. Information & Management, 53(5), 570-580.

Shi, W., Shambare, N., & Wang, J. (2008). "The adoption of internet banking: An institutional theory perspective," Journal of Financial Services Marketing 12(4), 272-286.

Siddiquee, N. A. (2005). “Public Accountability in Malaysia: Challenges and Critical Concerns,” International Journal of Public Administration, 28(1), 107-129.

Simon, H.A. (1960) The new science of management decision. USA: Prentice-Hall, ISBN 0-13-616136

Simonsson, M. & Johnson, P. (2006). Defining IT Governance - A Consolidation of Literature. In Working Paper of the Department of Industrial Information and Control Systems, Royal Institute of Technology (KTH), 103, Stockholm.

Simonsson, M., Johnson, P. & Ekstedt, M. (2010). “The effect of IT governance maturity on IT governance performance,” Information Systems Management, 27 (1), 10–24.

Sitkin, S. B. & George, E. (2005). "Managerial trust-building through the use of legitimating formal and informal control mechanisms," International Sociology (20(3), 307-338.

Smaltz, D.H., Carpenter, R. and Saltz, J. (2007), “Effective IT governance in healthcare organisations: a tale of two organisations”, International Journal Healthcare Technology and Management, Vol. 8 Nos 1/2, pp. 20-41.

Smith, G. (2006). Straight to the Top: Becoming a World-Class CIO. Chichester:: John Wiley & Sons.

Smits, D. & van Hillegersberg, J. (2015). IT Governance maturity: Developing a maturity model using the Delphi method. In System Sciences (HICSS), 2015 48th Hawaii International Conference on (pp. 4534-4543). IEEE.

Snowden, S., Spafford, J., Michaelides, R. and Hopkins, J. (2006), “Technology acceptance and m-commerce in an operational environment”, Journal of Enterprise Information Management, Vol. 19, No. 5, pp. 525-539.

Soares-Aguiar, A. & Palma-Dos-Reis, A. (2008) Why do firms adopt E-procurement systems? Using a logistic regression to empirically test a conceptual model. IEEE Transactions and Engineering Management 55(1), 120–133.

Son, J. Y. & Benbasat, I. 2007. "Organisational Buyers' adoption and use of B2B electronic marketplaces: Efficiency- and legitimacy-oriented perspectives," Journal of Management Information Systems, 24(1), 55-99.

Sonntag, M., Mu¨ hlbacher, J., Reisinger, S., 2002. Personalization of web-based interfaces for humans and agents applied to e-government portals. In: Wimmer, M. (Ed.), Knowledge Management in e- Government, International Federation for Information Processing (IFIP). Laxenburg, Austria, pp. 210–222.

Ssewamala, F. M. & Sherraden, M. (2004). "Integrating saving into microenterprise programs for the poor: Do institutions matter?" Social Service Review 78(3), 404-428.

Staples, M., Niazi, M., Jeffery, R., Abrahams, A., Byatt, P., & Murphy, R. (2007). An exploratory study of why organisations do not adopt CMMI. Journal of Systems and Software, 80(6), 883-895.

Stoker, G. (1998). Governance as theory: five propositions. International social science journal, 50(155), 17-28.

Suchman, L., Blomberg, J., Orr, J.E. and Trigg, R. (1999), —Reconstructing technology as social practicell, American Behavioural Scientist, Vol. 43, No.3, pp 392-408.

Suddaby, R. (2010). "Challenges for Institutional Theory," Journal of Management Inquiry 19(1), pp 14-20.

Suluo, A. J. S. (2003). The role of Information and Communications Technologies in the insurance industry: The case of Tanzanian Insurance Organisations, MEM dissertation, University of Dares- Salaam, Tanzania.

Swan, J. E. & Oliver, R. L. 1989. "Postpurchase communications by consumers," Journal of Retailing 65(4), 516-533.

Szyliowicz, D. & Galvin, T. 2010. "Applying broader strokes: Extending institutional perspectives and agendas for international entrepreneurship research," International Business Review, 19(4), 317-332.

Tan, W., Cater-Steel, A. & Toleman, M. (2009). “Implementing IT service management: A case study focusing on critical success dimensions,” Journal of Computer Information Systems, 50(2), 1–12.

Tan, W., Cater-Steel, A. and Toleman, M. (2007). Implementing Centralised IT Service Management: Drawing Lessons from the Public Sector. 18th Australasian Conference

Teo, H. H., Wei, K. K., and Benbasat, I. (2003). Predicting intention to adopt interorganisational linkages: an institutional perspective. MIS Quarterly, 27 (1), 19-49.

Teo, T.S.H., Ranganathan, C. and Dhaliwal, J. (2006) Key dimensions of inhibitors for the deployment of web-based business-to-business electronic commerce, "IEEE Transactions on Engineering Management", Vol. 53, No. 3, pp 395-411

Teo, W. L., Manaf, A. A., & Choong, P. L. F. (2013). Information Technology Governance: Applying the Theory of Planned Behaviour. Journal of Organizational Management Studies, 2013, 1.

Teoh, S, (2006) . In favour of IT governance. Published on: Tuesday May 23, 2006, available from: http://startechcentral.com/tech/story.asp?file=/2006/5/23/corpit/14208148&sec=corpit

Thornton, P. H., & Ocasio, W. (2008). "Institutional logics," in R. Greenwood, C. Oliver, R. Suddaby and K. Sahlin-Andersson (eds.), The Sage Handbook of Organisational Institutionalism. Thousand Oaks, CA: Sage.

Thurmond, Veronica A., (2001). The Point of Triangulation. Journal of nursing scholarship, Vol. 33, No. 3, pp. 253-258

Titah, R. & Barki, H. (2009). "Nonlinearities between Attitude and Subjective Norms in Information Technology Acceptance: A Negative Synergy?," MIS Quarterly 33(4), 827-844.

Tolbert, P. S. & Zucker, L. G. (1983). "Institutional sources of change in the formal structure of organisations: The diffusion of civil service reform, 1880-1935," Administrative Science Quarterly, 28(1), 22-39.

Tolbert, P. S. (1985). "Institutional Environments and Resource Dependence: Sources of Administrative Structure in Institutions of Higher Education," Administrative Science Quarterly 30(1), 1-13.

Tornatzky, L. and Fleischer, M. (1990) The process of technology innovation, Lexington, MA, Lexington Books.

Tornatzky, L., & Fleischer, M. (1990). The process of technology innovation, Lexington, MA. Lexington Books.

Trott, P.(2001). The Role of Market Research in the Development of Discontinuous New Products. European Journal of Innovation Management, 4, 117-125.

Tu, W. and Zhang, J. (2008), “The components and practice of information technology governance”, Proceedings of the Workshop on Knowledge Discovery and Data Mining. Adelaide, Australia, pp. 465-8.

Valentina (Dardha) Ndou, (2004). E-Government for developing countries: opportunities and challenges. Electron. J. Inf. Syst. Dev. Countries 18 (1), 1–24.

Van Grembergen, W. & De Haes, S. (2009). Enterprise governance of information technology: achieving strategic alignment and value. New York, NY: Springer Science+ Media.

Van Grembergen, W. (2003). Introduction to the Minitrack: IT governance and its mechanisms, HICSS 2003. System Sciences, January, , p.242.

Van Grembergen, W., & De Haes, S. (2008). Information Technology Governance: Models, Practices, and Cases. IGI Publishing.

Van Grembergen, W., S. De Haes, & E. Guldentops. (2003). Structures, processes and relational mechanisms for IT governance. In Van Grembergen, W. (Ed.), Strategies for Information Technology Governance. Pennsylvania, USA: Idea Group Publishing,.

Vandenabeele, W. (2007). "Toward a public administration theory of public service motivation - An institutional approach," Public Management Review 9(4), 545-556.

Venkatesh, V. and Davis, F.D. (2000), “A theoretical extension of the technology acceptance model: four longitudinal field studies”, Management Science, Vol. 46 No. 2, pp. 186-204

Venkatesh, V., & Davis, F. D. (2000). "A theoretical extension of the Technology Acceptance model: Four longitudinal field studies," Management Science 46(2), 186-204.

Verhoef, C. (2007). Quantifying the effects of IT-governance rules. Sci Comput Program 67(2–3), 247–77.

Wangpipatwong, S., Chutimaskul, W., & Papasratorn, B. (2009). Quality enhancing the continued use of e-government web sites: Evidence from e-citizens of Thailand. International Journal of Electronic Government Research (IJEGR), 5(1), 19-35.

Ward, J. & Peppard, J. (2002). Strategic Planning for Information Systems (3rd edition). Chichester: John Wiley & Sons.

Warland, C. & Ridley, G. (2005). Awareness of IT control frameworks in an Australian state government: A qualitative case study. Proceedings of the 38th Hawaii International Conference on System Sciences doi:10.1109/HICSS.2005.116

Webb, P., Pollard, C., & Ridley, G. (2006). Attempting to define IT Governance: wisdom or folly? In: Proceedings of 39th Annual Hawaii International Conference on System Sciences, pp.194a. IEEE, Hawaii, USA.

Weill, P. & Ross, J. W. (2004). IT Governance: How Top Performers Manage IT Decision Rights for Superior Findings. Boston, MA: Harvard Business School Publishing.

Weill, P. & Woodham, R. (2002). Don't just lead, govern: Implementing effective IT governance, CISR WP No. 326. Cambridge, MA: MIT Sloan School of Management.

Wilkin, C. L. & Chenhall, R. H. (2010). "A review of IT Governance: A taxonomy to inform accounting information systems," Journal of Information Systems, 24(2), 107–146. doi:10.2308/jis.2010.24.2.107

Wilkin, C. L. Campbell, J., & Moore, S. (2013). "Creating Value through Governing IT Deployment in a Public/Private-Sector Inter-organisational Context: A human agency perspective," European Journal of Information Systems, 22(5), 498–511. doi:10.1057/ejis.2012.21

Wilkin, C., & Riddett, J. (2009). IT Governance Challenges in a Large Not-for-Profit Healthcare Organization: The Role of Intranets. Electronic Commerce Research, 9(4), 351-374.

Willson, P. & Pollard, C. (2009). "Exploring IT Governance in Theory and Practice in a Large Multi-National Organisation in Australia," Information Systems Management, 26(2), 98 - 109.

Wimmer, H., & Aasheim, C. (2017). Examining Factors that Influence Intent to Adopt Data Science. Journal of Computer Information Systems, 1-9.

Winniford, M., Conger, S., & Erickson-Harris, L. (2009). Confusion in the Ranks: IT Service Management Practice and Terminology. Information Systems Management, 26(2), 153 - 163.

Wu, W. Y. & Li, C. Y. 2007. "A contingency approach to incorporate human, emotional and social influence into a TAM for KM programs," Journal of Information Science, 33(3), 275-297.

Xue, Y., Liang, H., & Boulton, W. R. (2008). Information technology governance in information technology investment decision processes: The impact of investment characteristics, external environment, and internal context. Management Information Systems Quarterly, 32(1), 67–96.

Yin, R. K. (2009). Case Study Research: Design and Methods, Essential guide to qualitative methods in organizational research. Applied Social Research Methods Series, 219.

Zheng, D., Chen, J., Huang, L., and Zhang, C. (2013). E-government adoption in public administration organisations: integrating institutional theory perspective and resource-based view. European Journal of Information Systems, 22(2), 221-234.

Zsidisin, G. A., Melnyk, S. A., and Ragatz, G. L. (2005). "An institutional theory perspective of business continuity planning for purchasing and supply management," International Journal of Production Research 43(16), 3401-3420.

Zucker, L. G. (1977). 'The role of institutionalization in cultural persistence'. AmericanSociological Review, 42, 726-743

Zucker, L. G. (1991). "The role of institutionalization in cultural persistence." In W. W. Powell and P. J. DiMaggio (eds.), The New Institutionalism in Organisational Analysis. University of Chicago Press: Chicago, IL, pp. 83-107.

Zucker, L. G., & Darby, M. R. (2004). "An Evolutionary Approach to Institutions and Social Construction: Process and Structure," in, K. G. Smith and M. A. Hitt (eds.), Great Minds in Management. New York: Oxford University Press, pp. 547-571.

Zutshi, A. & Sohal, A. (2004). "Environmental management system adoption by Australasian organisations: Part 1: Reasons, benefits and impediments," Technovation, 24(4), 335-357.

Appendix A

College of Business, Arts and Social Sciences Research Ethics Committee
Brunel University London
Kingston Lane
Uxbridge
UB8 3PH
United Kingdom

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8 January 2016

LETTER OF APPROVAL

Applicant: MR KHALIFA AL-FARSI

Project Title: IT governance

Reference: 1670-LR-Jan/2016-1215

Dear MR KHALIFA AL-FARSI

The Research Ethics Committee has considered the above application recently submitted by you.

The Chair, acting under delegated authority has agreed that there is no objection on ethical grounds to the proposed study. Approval is given on the understanding that the conditions of approval set out below are followed:

- The agreed protocol must be followed. Any changes to the protocol will require prior approval from the Committee by way of an application for an amendment.

Please note that:

- Research Participant Information Sheets and (where relevant) flyers, posters, and consent forms should include a clear statement that research ethics approval has been obtained from the relevant Research Ethics Committee.
- The Research Participant Information Sheets should include a clear statement that queries should be directed, in the first instance, to the Supervisor (where relevant), or the researcher. Complaints, on the other hand, should be directed, in the first instance, to the Chair of the relevant Research Ethics Committee
- Approval to proceed with the study is granted subject to receipt by the Committee of satisfactory responses to any conditions that may appear above, in addition to any subsequent changes to the protocol.
- The Research Ethics Committee reserves the right to sample and review documentation, including raw data, relevant to the study.
- You may not undertake any research activity if you are not a registered student of Brunel University or if you cease to become registered, including abeyance or temporary withdrawal. As a deregistered student you would not be insured to undertake research activity. Research activity includes the recruitment of participants, undertaking consent procedures and collection of data. Breach of this requirement constitutes research misconduct and is a disciplinary offence.

Professor James Knowles

Chair

College of Business, Arts and Social Sciences Research Ethics Committee
Brunel University London

Appendix B

Brunel University London

CONSENT FORM

The participant should complete the whole of this sheet

Please tick the appropriate box

	YES	NO
Have you read the Research Participant Information Sheet?	☑	☐
Have you had an opportunity to ask questions and discuss this study?	☑	☐
Have you received satisfactory answers to all your questions?	☑	☐
Who have you spoken to?		
Do you understand that you will not be referred to by name in any report concerning the study?	☑	☐
Do you understand that you are free to withdraw from the study:		
• at any time?	☑	☐
• without having to give a reason for withdrawing?	☑	☐
• (where relevant, adapt if necessary) without affecting your future care?	☑	☐
(Where relevant) I agree to my interview being recorded.	☑	☐
(Where relevant) I agree to the use of non-attributable direct quotes when the study is written up or published.	☑	☐
Do you agree to take part in this study?	☑	☐

Signature of Research Participant: [signature]

Date: 19-04-2016

Name in capitals:

Witness statement

I am satisfied that the above-named has given informed consent.

Witnessed by:

Date:

Name in capitals:

Researcher name: Khalifa Al-Farsi	Signature: [signature]
Supervisor name: BIDIT DEY	Signature: [signature]

Appendix C

Embassy of the Sultanate of Oman
The Office of the Cultural Attaché

سفارة سلطنة عمان
الملحقية الثقافية - لندن

To Whom It May Concern

This is to endorse Mr. **KHALIFA ALI SAID ALFARSI**, a PhD candidate at University of Brunel in his current pursue for data collection.

Mr Al-Farsi is conducting research be in OMAN public sector organizations.
The project aims to increase understanding of the characteristics of effective administrative issues.

He will assure all participants that all data will be processed on an ANONYMOUS basis and responses will be treated as STRICTLY CONFIDENT, and no details related to any individual or organization will be available to any other party

Any assisted given to him will be highly appreciated

Sincerely,

Mr. Musallam Al Amri

Cultural Attaché

64 Ennismore Gardens, London SW7 1NH
Tel: 020 7838 3853 Fax: 020 7584 6435
E-Mail: cao@omanembassy.org.uk
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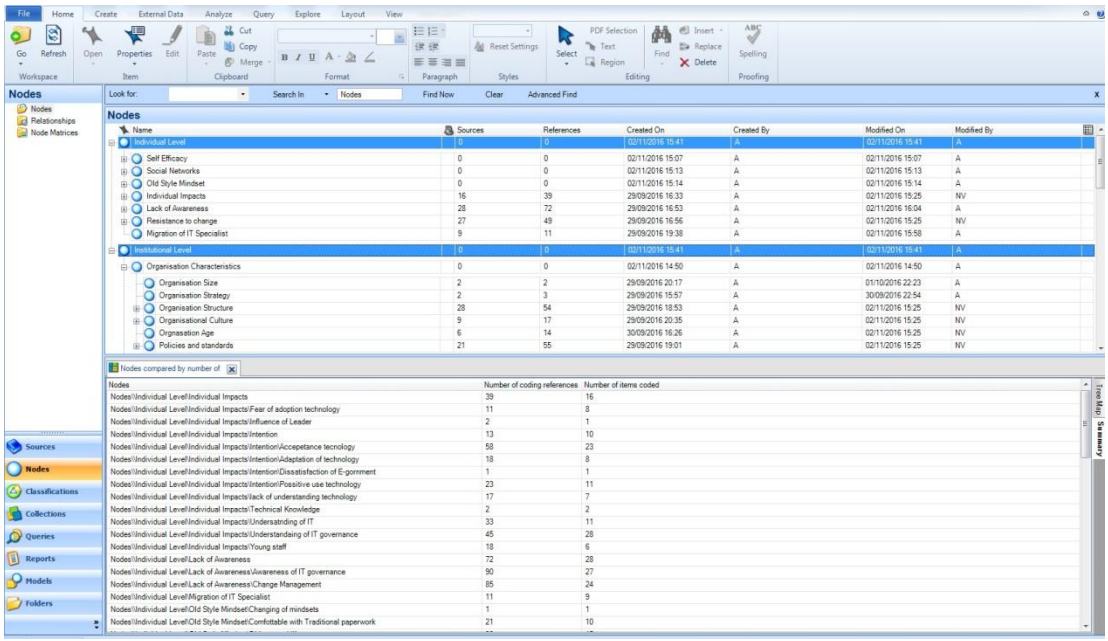
Appendix D

Sample Coding by NVivo



Appendix E

Interview Questions

1. Do you think that IT adoption/implementation is an easy/difficult concept/process in the public sector? Why?
2. How do you think the adoption of a new technology or any innovation is used in the organisation? Please explain.
3. Please explain the IT infrastructure in your organisation.
4. Please explain the IT decision-making process in your organisation.
5. What is the attitude of your organisation's top management towards IT adoption?
6. What is IT governance? Why is it important?
7. Does your organisation practice IT governance? How?
8. What are the dimensions for IT governance adoption in the public sector?
9. What are the pressures/forces of IT governance adoption?
10. Are you interested in using IT governance? Why?
11. Do the people in your group impact your decision on IT adoption, such as IT governance? Please explain.
12. Are you ready to use and support IT governance? Please explain.
13. Is there anything else you would like to add?