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Chapter1

Introduction

1.1Context of the study

Nowadays for many organizations around the world, Information Technology (IT) is considered one of the vital elements in organizations daily operations and success. Internationally, there is an agreement that successful IT investments have created and continue to create added value for organizations especially for organizations competing globally. IT systems are considered the backbone to almost every organization activities such as administration, accounting, finance, planning and communication. IT systems store, analyze and interpret different types of information and knowledge assisting in improving operations and enhancing processes. IT solutions provide prospects to exploit new business opportunities, better access to market and faster competitive response. As a result, IT provide management with better data analysis and decision making tools which positions IT as a business enabler. Organizations ability to properly store, process, analyze, share and interpret information allows them to have better knowledge which is critical to compete and stay ahead in today's world (Brown, 2006; ITGI, 2009).

Recent studies show an increasing awareness in organizations executives considering IT as a critical strategic factor which can support the organization to be more productive (Caporarello, 2007). Moreover, according to Information Technology Governance Institute (ITGI) study (2008) for more than 250 non-IT executives of both large and small companies around the world; 51 % of them considered IT very important to the enterprise ability to achieve its strategy or vision and 35 % considered IT as Somewhat Important. Therefore, significant investments are made in IT, according to the World Information Technology and Service Alliance (WITSA); in 2008, 6.4 % of world GDP was on Information Communication Technology (ICT) spending.

From above discussion we deduce that proper management of IT investment is critical to every organization success and sustainability. In the recent years, the concept of Information Technology Governance (ITG) came into surface to tackle the issues of IT not properly addressing business needs and how to organize the relation between business and IT so that IT become a business enabler and those investment achieve their anticipated returns.

1.2 Overview of purpose, problems and significance

The purpose of this research is exploratory and descriptive in nature where we will notice this in the research questions formation and the fact that our research approach will be deductive. In this research, I will be aiming to investigate ITG practices in Dubai Government organizations. I will be concentrating to meet the following research objectives:

- To investigate the extent to which the concept of ITG is recognised, formalised, established and accepted in Dubai Government organizations.
- Evaluate current ITG practices and identify the main drivers behind adopting or seeking to implement certain ITG practices in Dubai Government organizations.
- To identify the Critical Success Factors leading to an effective ITG practices in government organization.

Throughout this study, I will be reviewing the existing literatures, models, and practices of ITG to build knowledge about the topic regarding the concept and practices of ITG, the factors leading to an effective ITG practices and the relation between ITG practices and improved effectiveness of IT in organizations.

The findings will be used to feed into case studies conducted on a sample of Dubai Government organizations. In the case study I will be looking to answer the research questions and meet the defined research main objectives. The use of case study as primary data will allow having more insights in the face to face semi-structured interviews. The secondary data from literature review for previous studies, researches, industry models and best practices will also feed into meeting the research objectives by comparing the case study results the literature review key findings. This study will help to identify current ITG practices including its strengths and weaknesses, present the successful practices for other to benefit and accordingly the recommendation should help in developing the ITG in the selected case studies and possibly for other Dubai government organizations.

1.3 Overview of project content

This project contains eight chapters as described below:

Chapter 1: Introduction:

This is the introduction chapter, it provides background introduction about the area of study. It presents the importance of IT and the role of ITG in enhancing IT role in an organization. It will also present the research purpose, problems and significance. In addition, it also presents the research structure and an overview of the chapter's content.

Chapter 2: Literature Review:

This chapter contains the literature review where I will be studying previous literatures, researches, studies and common ITG models, frameworks and standards. The chapter will start by presenting the concept of CG, its benefits and the relationship between CG and ITG. Then I will be exploring the concept of ITG, how it emerged, discuss the main practices, ITG drivers and main benefits of ITG. After that, I will look at the main elements and principles of an effective ITG model or framework and extract critical success factors leading to an effective ITG arrangement in an organization.

Chapter3: Case Study Context

This chapter will present the background about the case study and research scope area which is Dubai. It will present a brief about Dubai and what is so special about it. It will also, present a background about IT in Dubai and how it is perceived. Finally, it will go over ITG practices in Dubai which was retrieved from news, magazines websites and limited research about this topic for Dubai. This chapter is important to give the reader a clear background of the environment and surrounding facts before we go to the case study itself and the analysis part later.

Chapter4: Research Framework and Methodology

In this chapter, I will present the research framework and methodology where I will be employing the research onion approach. I will be discussing the research philosophy, approach, strategy, choices, and time horizon. Also, I will discuss the methods of sample selection and data collection with explanation of why it was selected and how the case study was selected and designed.

Chapter5: Case study:

This Chapter will present the case study details about ITG in Dubai and how the interviews which are considered the primary data collection tool took place. It will include responses documentation for the semi-structured interviews for the selected sample. This will be critical to show the reader how the data collection took place and the main noted responses and insights from these interviews. This will feed into the data analysis chapter and having the interviews responses documented allows evidencing the analysis and making the derived findings more credible.

Chapter6: Data Analysis:

This chapter will present collected data analysis and findings based on the selected methodology and approach. The qualitative data will be analyzed, categorized and relations will be identified to find main insights and results to answer meet the research objectives.

Chapter7: Analysis Discussions

Based on the case study and data analysis and results chapters discussions and comparisons will be presented to identify internal and external relations in the categories. In additions the organizations analysis results will be compared with the expert interview main findings.

Chapter 8: Conclusion and Recommendations

In this chapter the results from chapter 6 and 7 will be presented. In addition the research main conclusion along with recommendations will be presented. The results will be compared to present how it meets the research objectives. The recommendations will be to case study organizations and also other recommendations to improve ITG practices in Dubai government organizations in general. Finally, the research limitations and possible future work will be discussed.

Chapter 2

Literature Review

2.1 Introduction

In this chapter, I will be studying existing literature to examine models and practices of ITG in order to build knowledge about the topic. ITG concept emerged from a larger concept known as Corporate Governance (CG) (Jordan and Musson, 2004). Therefore, I will start by exploring the concept of CG its drivers and its relation to ITG. Then I will start looking at ITG in details by looking at ITG definitions and drivers. In addition, I will present and analyze common models, frameworks and standards of ITG and their relationship with IT/business alignment. After that, I will be discussing the main elements and principles of an effective ITG model or framework and extract critical success factors (CSF) leading to an effective ITG arrangement in an organization.

2.2 Corporate Governance

Over the last two decades Corporate Governance (CG) has been one of the main topics in business and corporate management across the globe (Mueller, 2006). It has become increasingly important globally and gained higher priority in corporations agendas, especially after the scandals of multiple global corporation such the Enron and MCI WorldCom in United States (US) as well as the other corporate scandals, such as Adelphia Communications (Masters and White, 2004). This in turn increased shareholder and government's attention to the importance of CG. This was reflected in the passage of the Sarbanes-Oxley Act of 2002 by US federal government in an effort to restore public confidence in CG (Crawford, 2007). Similarly in United Kingdom (UK) and Europe Cadbury report, titled *Financial Aspects of Corporate Governance*, was published in 1992 which contained a set of recommendations on the arrangement of organizations boards and accounting systems as an attempt to resolve or reduce the risks of poor governance practices (Cadbury Report, 1992). In addition, the great interest in this topic allowed the formation of several institutions, forums and working groups, locally and globally such as Information System Audit and Control Association (ISACA), the International Corporate Governance Network (ICGN), Global Corporate Governance Forum, European Corporate Governance Institute (ECGI) and others. These institutions were focusing on improving CG

practices through fostering, standards of CG worldwide, promoting best practices and guidelines, and supporting initiatives that address CG issues.

Furthermore, the recent global financial crisis revealed severe deficiencies in current CG practices and that some of the current are not effective CG practices and often failed to provide the needed controls in order to develop sound business practices. As a result, policy makers and economic forums around the world strongly acknowledge the importance of developing effective CG practices and implementation which in turn reinforced the importance of CG. Studies show that organizations with higher CG practices had been less impacted by this financial crisis (Eyeofdubai, 2008; OECD, 2010; Barker, 2009).

These multiple business failures were reasoned to poor governance practices which exposed the type of corrupt behaviors that occurs when corporations fail to effectively monitor and control boards and managers authorities (Saidi, 2009). Poor governance is mainly associated with the matter of ensuring accountability of specific personnel or a decision in organizations by applying mechanisms and best practices to deal mainly with the principle-agent relationship problem. This principle was explained by Mayer (1996) as, *“Investors (the principals) employ managers (the agents) to run firms on their behalf. The interests and objectives of investors and managers differ. Corporate governance is concerned with ways of bringing the interests of the two parties into line and ensuring that firms are run for the benefit of investors”*. The aim is having good CG which ensures the integrity of corporations, financial institutions and which is critical indicator to the overall health and stability of economies. CG is normally linked with the structure and function of company’s boards and their relation with managers, the legal duties of CEO’s and how it best represents the interests of shareholders. If we want to look at some definitions of corporate governance then we will see several varying definitions. Sir Adrian Cadbury explained it on his report on Financial Aspects of Corporate Governance, known as Cadbury Report, as:

“Corporate governance is the system by which companies are directed and controlled” (Cadbury report, 1992).

This definition is relatively short but clear to the point of proper directing and control of companies. In addition, Sir Adam Cadbury further explained CG from a broader point of view as *“it is concerned with holding the balance between economic and social goals and between*

individual and communal goals. The governance framework is there to encourage the efficient use of resources and equally to require accountability for the stewardship of those resources. The aim is to align as nearly as possible the interests of individuals, of corporations, and of society” (Claessens , 2003). In this elaboration, Sir Cadbury insists that governance should include and balance between the economical and social aspects. He also confirms that CG is not only about the corporation but it should align the interests of all stakeholders’ including individuals, corporations and society. The Australian Securities Exchange (ASX) took another direction in defining corporate governance by looking at it as a framework, structure and authority. They defined it as *“Corporate governance is the framework of rules, relationships, systems and processes within and by which authority is exercised and controlled in corporations”* (ASX, 2007). The US Investment and Financial Services Association Guidance defines CG as *“Corporate governance is concerned with improving the performance of companies for the benefit of the conduct of and relationship between the board of directors, managers and the company shareholders”* (Doughty, 2005). Organization for Economic Cooperation and Development define CG as *“Corporate governance generally refers to the processes by which organizations are directed, controlled and held to account. It encompasses authority, accountability and stewardship, leadership, direction, and control exercised in the organization”* (Doughty, 2005)

In general the definitions of CG can be grouped into two main thoughts or schools; the first one is the traditional school focusing on the economical, financial goals of ensuring that firms maximize the wealth of shareholders which is common in US and UK and known as Anglo-American CG. The second one is concerned with a broader scope of stakeholders, including employees, suppliers, customers, society and others as well as shareholders looking to a wider socio-economical goals. This is more common in Japan and Europe and known as the Japanese CG school (Bhasa, 2004). Corresponding to the second school which looks at CG from a broader scope, it positions good CG as a mean for economic sustainable development and wealth maximization because they consider that the main objective of good CG practices is to maximize the contribution of companies to the overall financial system including all stakeholders. It also incorporates the topic of corporate social responsibility and firms respect to culture and the environment (Sapovadia, 2003; Claessens, 2003).

To better understand corporate governance and what is concerned with, The Organization for Economic Co-Operation and Development (OECD) issued one of the most influential guidelines in CG which is based on six main principles, these principles are:

- 1- *Ensuring the basis for an effective corporate governance framework.*
- 2- *The rights of shareholders and key ownership functions.*
- 3- *The equitable treatment of shareholders.*
- 4- *The role of stakeholders.*
- 5- *Disclosure and transparency.*
- 6- *The responsibilities of the board.*

These principles has been accepted globally and developed into an international benchmark. As described by OECD secretary general Donald J Johnston “*The Principles are a living instrument offering non-binding standards and good practices as well as guidance on implementation, which can be adapted to the specific circumstances of individual countries and regions*” (OECD, 2004). These principles can be summarized into four pillars in which corporate governance practices can be assessed based on:

- Accountability.
- Fairness.
- Transparency.
- Responsibility.

2.2.1 Benefits of Good Corporate Governance

Here I will further list and describe the main benefits of having good CG practices in an organization. Beyond compliance with the legal obligations, these benefits are considered drivers for adopting CG practices in organizations where good CG practices can assist them to attain their objectives, attracting further investment and helping to strengthen the economy by promoting business integrity. The main driver of good CG ultimately is a strengthened economy and for this reason good CG is an instrument for socio-economic development (Claessens , 2003).

Some of the benefits of having good CG practices:

- Reduced risk of financial crises

Good CG can be linked with reduced risk of financial crises where companies with good CG practices usually have better relations with stakeholders, external financing parties and stronger market reputation. They also have more control and reduced potentials of fraud or management corruption due to accountability and control governance requirements. From the legal aspect, they will be better in complying with the organizations legal obligations (Doughty, 2005; Claessens , 2003).

- Increased access to financing:

Having good CG practices will allow greater and easier access to capital and fund from banks and investors. This is a result of higher transparency and financial strength that CG can achieve. This in turn can lead to larger investments and higher growth. In a 2002 McKinsey survey, six institutional investors said they are ready to pay premiums to own well governed companies (IFC, 2006).

- Higher firm valuation:

Higher ranking for and organization assures better recognition. This makes investments more attractive to investors. Thereby external financing parties are more assured that they are going to receive a good rate of return on their investments in well governed companies. According to S&P study of 500 firms carried out by Deutsche Bank, it illustrate that companies with better or improving CG outperforms those with poor or declining governance practices by about 19% over a two-year period (IFC, 2006).

- Better operational performance:

Good CG helps improving operations. According to A Harvard/Wharton study for US based firms; companies with better governance have faster sales growth and better profit than their peers (IFC, 2006).

- Better relations with other Stakeholders:

Having good CG leads to enhanced client service and protection to all investors.

Above benefits clarify the importance of having good CG practices and why is it considered a main element to decide on investment decisions on company's health status. As per the

International Finance Corporation (IFC)-World Bank Group: “Good corporate governance won’t just keep your companies out of trouble. Well-governed companies often draw huge investment premiums, get access to cheaper debt, and outperform their peers” (IFC, 2006).

In general, as per the Chartered Financial Analyst (CFA) institute, (2005) good CG practices aim to ensure that board members act in the best interests of the organization and shareholders. It should ensure that the organization interactions with all stakeholders are compliant with applicable laws, regulations and ethics. Also, it should insure that all shareholders have equal right to participate in the governance of the organization. In addition, all rights of shareholders and other stakeholders should be clearly defined and well communicated. Appropriate controls and procedures should be positioned in details clarifying management activities, roles and responsibilities in running the daily operations. Finally, all the organization operating, financial and governance activities should be constantly and transparently communicated to all shareholders in the most accurate, complete and verifiable method.

After demonstrating the importance of CG and the gains from having effective CG practices in organization, we will move to the concept of IT Governance and its relation to CG.

2.3 IT Governance

As demonstrated in the introduction, currently IT is considered one of the main elements in organization ongoing operations and success. Also that IT project are considered huge investments that provides organizations with higher opportunities to access new markets and allow organization to have faster competitive response. Therefore successful organizations realize the importance of properly managing IT investments and operations along with its associated risks to make best use of IT. IT projects carries considerable risks; these projects can be complex, costly, and time-consuming where many times it finish over time, over budget, changed scope and worst the final product or service fails to meet business needs. In such cases, all these efforts and large investments are wasted where sometimes it might severely impact the business and put it on the loss line. In the past few years, there have been many examples of stunning failures of IT project with large investments in many areas ranging from enterprise resource planning (ERP), customer relationship management (CRM), systems and e-solutions initiatives that were poorly conceived, unsuccessfully executed or newly developed systems that

were never used as planned (Weill and Woodham, 2002). According to Forester (2009) research, 47 % of CRM projects fail to meet the business or customer expectations (Krigsman, 2009; Computerworld, 2008). Also according to Standish group (2005) survey, 54 % of all IT projects are challenged and 18 % completely fails. In addition, the same survey revealed that 56 % of business executives and 38 % of IT executives felt that IT is under delivering against the investment made by business in it. Under half of both business and IT managers said that their company did not spend a good deal of time to ensure that IT spends are linked to deliver a business with value meaning in other words there is no alignment between business and IT.

In view of the fact that organizations worldwide increasingly depends on IT and recognize it as a fundamental building block and strategic partner, the need for Information Technology Governance (ITG) emerged. The importance of ITG and that it needs to be an integrated part of overall CG came into sight after the failures of multiple large organizational investments in IT infrastructure or systems. Therefore, the failure of IT might mean freezing business operations or even huge loss for business. In general, IT is similar to any project and investment; it needs to be properly managed through all the phases of selection, implementation, usage, and control to meet the organization objectives. Also to be in line with the overall organization needs objectives, and strategy. According to ITGI study in 2008, in the eyes of top non-IT executives, the main two motivators for implementing ITG within an enterprise are risk management and value delivery. ITG is an important part of overall CG that helps to ensure alignment of IT decisions with business goals and ensure that IT investments deliver added value for business (ITGI, 2009). According to Weill and Ross (2004) industry research, top performing enterprises produce returns on their IT investments up to 40 % better than their competitors. Therefore having good ITG is one of the most important factors in generating business value from IT.

There are many varying definitions for ITG where there is still no generally accepted definition for ITG (Brown & Grant, 2005). The ITGI, 2009 defined ITG as *“IT governance an integral part of enterprise governance and consists of the leadership and organizational structures and processes that ensure that the organization’s IT sustains and extends the organization’s strategies and objectives”*. On the other hand, Sambamurthy and Zmud definition did not include the strategy and IT business alignment aspects and concentrated more on distribution of authority and decision making. Sambamurthy and Zmud, (1999) defined ITG as *“a distribution authority*

for key IT activities in business firms, including IT infrastructure, IT use, and project management". Schwartz, (2007) definition was all around IT business alignment along with IT performance assessment. He defined IT governance as *"it represents a structure around firms, for aligning IT and business strategies, as well as implementing measures to assess the performance of IT"*. Weill and Ross, (2004) defined IT governance as: *"specifying the decision rights and accountability framework to encourage desirable behavior in using IT"*. Their definition added a new aspect which is specifying decision rights and as roles and responsibilities. On the other hand they agreed with Schwartz in the need to assess IT performance. The Australian Standard (AS) for Corporate Governance of IT (AS 8015), defines ITG as *"the system by which the current and future use of ICT is directed and controlled. It involves evaluating and directing the plans for the use of ICT to support the organisation and monitoring this use to achieve plans. It includes the strategy and policies for using ICT within an organisation"* (Standards Australia- AS8015, 2005). This last definition almost matches all previous definitions. It covers the strategy, IT business alignment, control, IT monitoring and assessment aspects.

From the definitions I can notice varying focus and view points, reviewing ITG definitions shows that they share certain common main components which could construct the components that an acceptable ITG definition should cover:

- Strategic business IT alignment
- Integrated part of CG
- Delivery added Value to business through IT
- Performance management
- Risk management
- Policies and procedures
- Control and accountability
- Authority and Decision making structure
- Defined roles responsibilities

After going over the concept of ITG and the definitions of ITG, there is a need to know the main drivers for organizations toward adopting and developing ITG practices.

2.3.1 IT Governance Drivers

After defining ITG, there is a need to identify and present the driving forces for the introduction of ITG and the benefits organizations are likely to gain by embracing such concepts. Also, why organizations are adopting or should adopt ITG practices? Why they should seek to have effective ITG practices?

Having good and effective ITG practices, ensures that the IT function is effectively meeting and satisfying business needs which in turn allowing organizations to deliver better operational results and very satisfying return on IT investments (Weill and Ross, 2004). In addition, researchers have found that there is a strong positive relationship between effective ITG and corporations achieving improved IT/business alignment represented in superior business results, higher return on investments, higher stakeholders satisfaction rates and improved recognition of IT role compared to their competitors (DeHaes and VanGrembergen, 2009; Weill and Woodham, 2002; Papp, 1999; Khaiata and Zualkernan, 2009; De Haes and Van Grembergen, 2009; Huang and Hu, 2007). As explained by Huang & Hu (2007) whenever effective alignment exists, IT delivers added value services that support the organization in meeting their operational and strategic needs. It will allow more management and users buy-in to recognize and better utilize IT resources (Huang and Hu, 2007). Furthermore, effective ITG practices will ensure enhanced and more efficient business processes allowing enhance productivity by simplifying and automating processes. In addition, it will also assist in streamlining business processes by reducing redundant and conflicting processes resulting in massive cost reduction. On the other hand, good ITG practices will help to reduce overall IT and business risks through proper risk management practices as part of ITG practices. In general, the ITGI board briefing second edition (2003), identified five key areas grouping the main benefits of an effective ITG:

- IT Strategic alignment with business
- Value added delivery through IT
- Management of IT and business risks
- IT resource management

- Performance management

These five key points represent the general areas that organizations will benefit from effective ITG. Proper management of these areas will allow better ITG practices and thereby having an effective IT function acting as a business enabler in an organization. On the other hand, the ITGI (2007), identified four main key drivers for ITG; stakeholder value, setting strategy, managing risk, delivering value and measuring performance.

In addition, Symons (2005) proposed four key objectives that drive ITG within organizations striving for excellence; IT value alignment, risk management, accountability and performance measurement.

By comparing ITGI (2003, 2007) key drivers and Symons (2005) four key drivers, we can see that they are similar which reinforces the importance of these drivers.

To summarize the main ITG drivers from previous review, the main drivers are:

- Proper IT Business Alignment

One of the main drivers for promoting effective ITG practices is that it is an approach to improve IT/business alignment which some researchers consider the core and the main objective of ITG. IT/business alignment is defined as “*the process and goal of achieving competitive advantage through developing and sustaining a symbolic relationship between business and IT*” (Duffy, 2002; De Haes and Van Grembergen, 2009). Another definition by Moody, 2003 is “*the alignment of an organization's IT resources with the objectives of its business unit*”.

- Compliance to legal and obligations

As presented earlier especially in USA and Europe, the main driver toward employing CG and ITG practices is to comply with legal obligation such as Cadbury report, Sarbanes Oxley and Basel2 for governance requirements and other information related regulations for data protection such as GLBA, HIPAA, PCI and SB-1386. Legal compliance can be considered the main driver because it represents enforcement for certain parts of ITG practices especially IT security.

- Delivering added values through IT

IT value delivery is mainly concerned with providing projects or services on-time, on-budget with the highest quality to assure satisfaction. It also, extends to providing added value by introducing efficiencies to the business through improved processes, optimized expenses, higher productivity and ROI for the overall organization.

- Efficient use and management of IT resources.

Efficient resource management includes proper management of resources including human (promoting innovation, feedback, skills development, knowledge management, and training) and other normal assets such as hardware and software in terms of efficient and effective use allowing minimum expense with maximum value.

- Proper Risks Management.

ITG ensures proper risk management to properly identify, manage and control any IT or business risks. There cannot be effective ITG without appropriate risk management. While strategic alignment addresses the issue of creating value, the risk management emphasizes preserving existing value.

- Proper measurement and control of IT performance.

A prerequisite to improvement is measurement. In this respect, continuous measurement and control of IT projects and services is one of the main aspects of ITG practices that are essential to fulfill the accountability requirements for IT. Continuous control and measurement help identify current situation gaps and accomplishment and help identify if objectives are met or not.

Above main drivers were retrieved from academic research and industry frameworks, however in my opinion, if we want to look at ITG drivers there are three drivers that have to be mentioned such as for the certification itself where organization or IT departments seek certain ITG certification for marketing or exposure purposes internally to the organization and externally to the competitors and market. Another driver could be seeking ITG practices because this is the trend in the market without any serious knowledge or intent to achieve the real benefits. In addition, another driver could be due to enforcement from government or a business partner as one of the conditions which can be considered a different type of compliance.

In general, whatever the organization drivers are, for sure certain drivers will have more priority than others and this priority varies between organizations where each organization has its own unique environment and different effecting factors. The key point here is that all organizations

are advised to look at the drivers and make sure that it is not only legal compliance where in such situation the buy-in will be and minimal and seek to the ITG benefits might be of less priority.

2.3.2 IT Governance practices

Every organization, large or small, public or private needs structured mechanisms and frameworks to help in building and maintaining the alignment of IT function with the organization overall strategy (Schwartz, 2007). In this section, I will present, analyze, and compare main ITG practices. I will be looking at some of the industry best practices, frameworks and standards along with ITG models from researchers as part of the literature review.

According to Brown and Grant, (2005) the term ITG is not a well established concept in academic research, however the literature review revealed that significant previous work has been done using other several notions similar to the current understanding of IT Governance concept such as IT decision rights and IT business alignment. On the other hand, growing number of standards, frameworks, best practices and guidelines are emerging to cover different aspects of ITG and gained substantial interest from the IT industry such as:

- Control Objectives for Information and related Technology (COBIT)
- Information Technology Infrastructure Library (ITIL)
- Capability Maturity Model Integration (CMMI)
- International Organization for Standardization (ISO) International Electrotechnical Commission (IEC) ISO/IEC 27001:2005 standard.
- ISO/IEC 38500:2008
- Symons 2005
- Weill & Ross 2005

These are samples for the main recognized ITG related practices that are already being adopted internationally. Therefore I will be presenting an overview of each in this section as part of the literature review.

A. COBIT (Control Objectives for Information and related Technology) Framework

It was developed by the IT Governance Institute (ITGI) in 1996 and currently is version 4.1. It is one of the most internationally accepted ITG standards where many organizations adopt it to help in their efforts to maximize the benefits of IT. COBIT framework is focused on high level IT objectives and its ownership concentrating on meeting organization needs from IT through a group of naturally grouped processes. In general, COBIT identified seven information criteria's (effectiveness, efficiency, confidentiality, integrity, availability, compliance and reliability) as well as key IT resources (application, information, infrastructure and people) required to implement and support the IT/business objectives. COBIT provides 34 key high levels IT processes divided into 210 high levels IT control objectives grouped into four main areas:

- Planning & Organization (PO):

This area concentrates on high strategic level of IT business alignment and how IT can best contribute to business success. It covers setting an IT strategy that is in line with business strategy, making best use of IT resources at the efficient quality and proper management of IT related risks from management point of view.

- Acquisition & Implementation (AI): this area concerned with identification, development and implementation of proper IT solutions for business to be integrated into business processes. It is also concerned with the assurance if existing solutions are still meeting the IT and business strategy.

- Delivery & Support (DS): This area focus on the efficient and effective delivery of needed services including managing service levels and ongoing support and operations, workforce abilities and security.

- Monitoring & Evaluate (ME): This area focuses on the ongoing monitoring and assessment of quality, performance, control and compliance with the identified business requirements and IT strategy. It also includes obtaining independent assurance and audit.

For each of the 34 key IT processes, a link is made to the business and IT goals that are supported. In addition COBIT provides detail on how to measure the goals, the key activities,

major deliverables and who is responsible for them. Moreover, COBIT provides management with a toolbox containing:

- Performance measurement elements (outcome measures and performance drivers for each IT process)
- A list of critical success factors that provides concise non-technical best practices for each IT process.
- Maturity levels (0-5 scale) similar to CMMI model to assist in benchmarking and decision-making for process improvements (Figure 2.1).

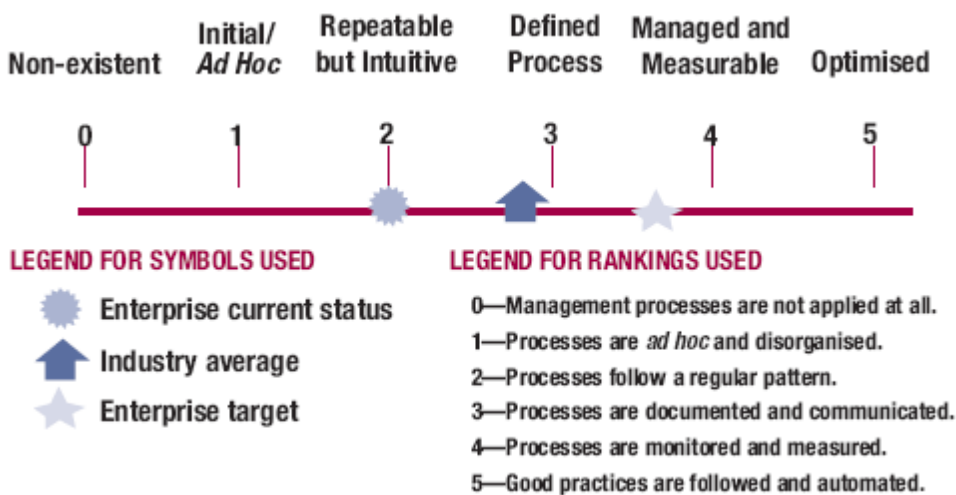


Figure 0.1- COBIT (0-5) scale – (Source, ISACA 2007)

- Activities and guidance on roles and responsibilities in a Responsible, Accountable, Consulted and Informed (RACI) chart for each specific IT process.

The COBIT framework by itself is mainly concentrating on what is needed to achieve proper management of IT and this is why it is always high level. However, to resolve the issue of being too general, COBIT produced several guidance materials organized in to three level:

- Executive management and board
- Business and IT management
- Governance, assurance, control and security professionals.

These documents aimed to help integrating COBIT with other more detailed ITG practices. Following are group of COBIT guiding documents:

- *Board Briefing on IT Governance, 2nd Edition*, it is designed to help executive to understand what it about, why ITG is important, and what their responsibilities to manage it.
- Management guidelines/maturity models, is a guideline help to assign responsibilities, measure performance, and benchmark and address gaps in capabilities.
- Frameworks, intended to organize ITG objectives and good practices through the mentioned COBIT IT domains and processes, and then help link them to business requirements.
- Control objectives; aimed to provide a complete set of high-level requirements to be looked at by management for effective control of each IT process.
- *IT Governance Implementation Guide: Using COBIT and Val IT TM, 2nd Edition*; provides a generic road map for implementing IT governance using the COBIT and Val IT resources.
- *COBIT Control Practices: Guidance to Achieve Control Objectives for Successful IT Governance, 2nd Edition*; provides guidance on controls importance to be implemented and how to implement them.
- *IT Assurance Guide: Using COBIT*, provides guidance on how COBIT can be used to support a variety of assurance activities together with suggested testing steps for all the IT processes and control objectives.

Figure (1.2) summarize the overall COBIT framework and how various components related.

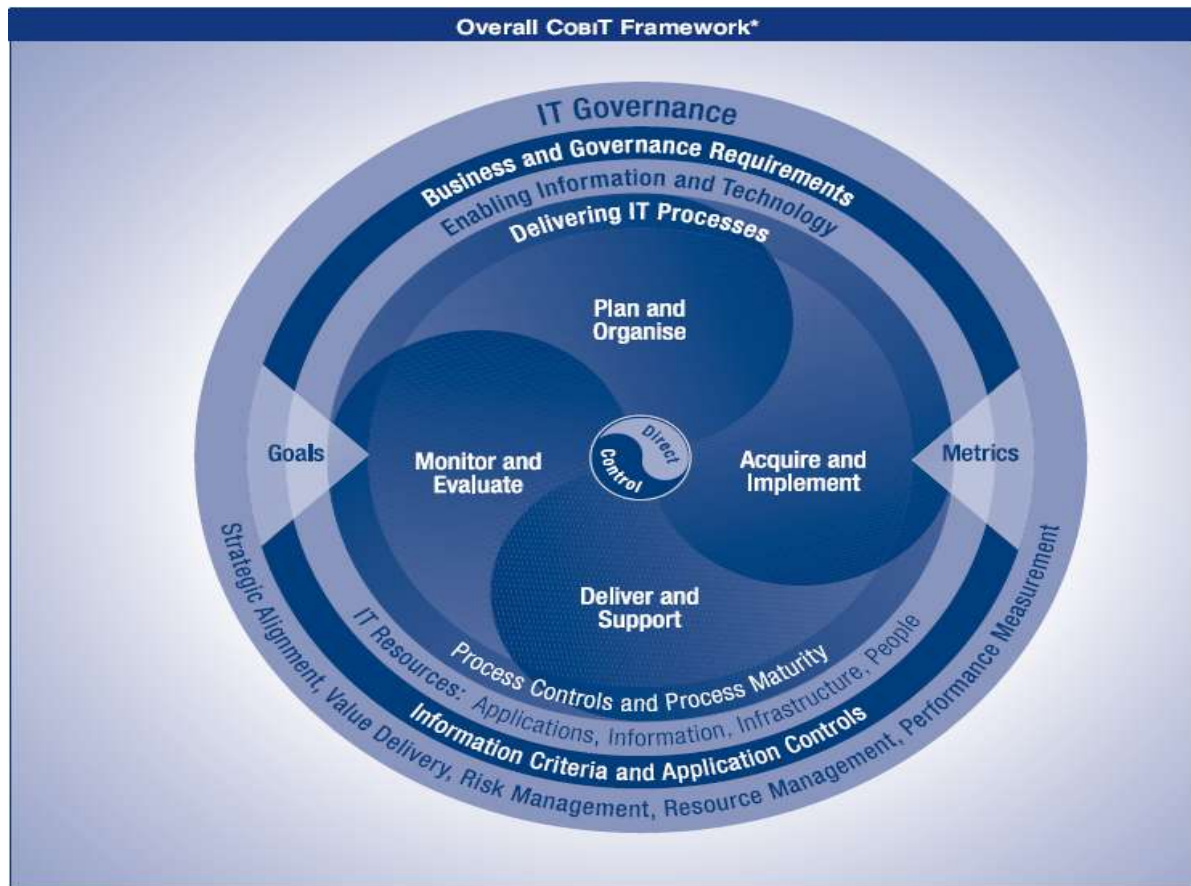


Figure 2.2- Overall COBIT Framework from (Source,ISACA, 2007)

COBIT has been reviewed by many researchers and several case studies and implementations around the world (ITGI Case Studies/Best Practices, 2009) indicated the benefits and added value from adopting COBIT framework for ITG arrangements in organizations. COBIT can be mapped to other ITG models such as ISO/IEC 17799 for information security, CMM for solution delivery and ITIL for service delivery. ITGI provides guiding documents in this regard to demonstrate how COBIT can work and complement other standards strengths in the implementation side. On the other hand, some of the critics of COBIT point that it is based on from an audit perspective which might limit it to this perspective. Also, at the implementation side there are reviews indicating difficulties with adopting COBIT since it is high level and does not show details on how to implement which shows why COBIT is issuing guiding documents in mapping COBIT to other detailed frameworks and standards (Tuttle and Vandervelde, 2007) (Abu-Musa, 2009) (ITGI.com).

B. Information Technology Infrastructure Library (ITIL) model

ITIL is a collection of best practices specifically for IT service management. ITIL has been developed and widely implemented globally over the past 20 years. ITIL's guidance is written from the perspective of the IT professionals and is meant at alignment with the business focused on providing efficient and effective IT services. ITIL is composed of a series of books guiding in the provisioning IT service management (ITSM). ITIL version2 is known as ISO/IEC 20000 after it became a standard. Currently ITIL is version 3 which is called The Service Lifecycle, published in 2007 and composed of five volumes or libraries:

- ITIL Service Strategy

This volume concentrates on ensuring that the service strategy is defined, maintained and implemented. It contains topics such as service definition, value creation, and market analysis. It focuses on processes such IT financial management and IT service portfolio management.

- ITIL Service Design

Focus on setting the proper service and process design to convert the strategy into fact. ITIL service design attempts to look at the design from all perspectives to cover all the relevant elements such as technology, environment, and architecture. Example for services covered by the ITIL design module are service level, capacity, continuity, supplier, service warranty and IT security management.

- ITIL Service Transition

ITIL service transition focus on the quality and control of IT service delivery to operations. Mainly it seeks to effectively close the gap between projects and operations. It includes a list of processes such as service, asset and configuration, evaluation and testing, change, and knowledge management.

- ITIL Service Operation

Aim to achieve the service delivery as per the agreed service levels for all parties. ITIL service operation includes technical, application, operation and service desk management. Some of the processes are event, incident, and access management.

- ITIL Continual Service Improvement

The module focuses on ensuring continuous adaption of IT services and processes to dynamic business needs. It also includes assuring continuous service and process improvement to support

business new requirements to achieve effectiveness and efficiency. This module spans around all other four modules to assure integrated continuous improvement. Processes in this module include service measurement and reporting and continual service improvement.

Following diagram (Figure 2.3) illustrate ITIL v3 (The Service Lifecycle) components and how they interact (Official ITIL Website, 2010) (OGC, 2010) (BMP, 2007)

The Service Lifecycle

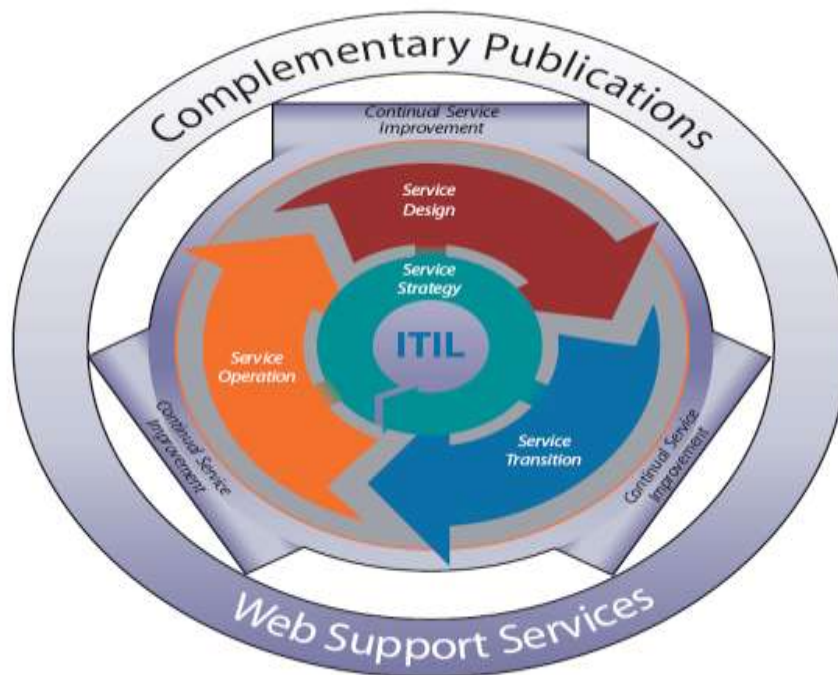


Figure 0.3 - ITIL Service Life Cycle (Source, Official ITIL Website, 2010)

C. Capability Maturity Model Integration (CMMI) Model

The CMMI is “a process improvement approach that provides organizations with the essential elements of effective process that ultimately improves their performance” (SEI, 2010). It was developed by the Software Engineering Institute (SEI) to enhance and develop software developments through a framework of continuous process improvement. CMMI has been extended to be applied in many other areas beyond software engineering to organizational and project development. CMMI is currently v1.2 and has gained global recognition and being adopted worldwide. CMMI focus on three main areas:

- 1- Product and service development through CMMI for Development (CMMI-DEV)

- 2- Service establishment, management, and delivery through CMMI for Services (CMMI-SVC)
- 3- Product and service acquisition through CMMI for Acquisition (CMMI-ACQ).

CMMI collects the latest best practices to guide the improvement organization process maturity in many areas such as vendor management, process development and system engineering. The CMMI identifies five levels of process maturity for an organization:

- Maturity level 1: Initial

This is the lowest maturity level where the processes are characterized as unmanageable and are defined at ad hoc basis. Most of the processes might be not be efficient and are inconsistent. Successful processes in such organizations depend on heroic people (one man show) not on the processes. At time of stress it's most likely the success will not repeat.

- Maturity level 2: Managed

At this maturity level, organizations have defined processes and policies in place. These policies and processes are characterized as consistent with the overall organizational policy. It is ensured that the execution is as per the plan. They have good resources and qualified staff to deliver the required plans. Good monitoring and control is in place to ensure consistent deliverables. At time of stress such organization is more likely to deliver consistent results according to the defined processes; however there is a possibility that few defined processes get missed depending on the project situation.

- Maturity level 3: Defined

At this level the processes are well defined and understood. It is defined in standards, procedures descriptions, tools and methods for a project or service and is tailored from the organizational standards to match a particular project. The set of processes and standards are being improved over time and are used to establish consistency throughout the organization. The main differences between maturity level 2 and 3 are the scope and the processes. Organizations with maturity level 3 have more mature processes where the general practices of level 3 are addressed.

- Maturity level 4: Quantitatively Managed

At maturity level 4 processes are managed using quantitative objectives which are based on the customer needs. Process performance is well defined and managed clearly using quantitative measures along with qualitative techniques throughout the phases of process life cycle which

make processes quantitatively predictable. The main difference between maturity level 3 and 4 is the predictability of process performance where in level 3 is only qualitatively predictable.

- Maturity level 5: Optimized

Maturity level 5 is the highest one where the organization continually develops its processes through innovative and technological enhancements. This improvement is based on a quantitative understanding of the common causes of variations inherent in the processes. The organization seeks to achieve their established quantitative process improvement objectives, which is main difference between Level 5 and 4. (SEI, 2010) (CMMIFAQ, 2009) (SEI, 2007)

D. International Organization for Standardization (ISO) International Electrotechnical Commission (IEC) ISO/IEC27001:2005 Standard

ISO 27001 standard was published in 2005, it was based on the BS7799-2 standard. It is mainly covering the IT Security side of ITG. ISO27001 is an Information Security Management System (ISMS).

The objective of the standard itself is to provide a framework for establishing, implementing, operating, monitoring, reviewing, maintaining, and improving the ISMS in an organization. It defines a set of information security management requirements. The standard utilizes the Plan-Do-Check-Act (PDCA) model to structure the processes and reflect the OECD guideline principles. ISO27001 is part of ISO27000 standards series composed of:

- ISO 27001: The specification for an information security management system (ISMS)
- ISO 27002: Is the code of practice for information security (previously known as ISO/IEC 17799:2005). It presents a group of potential controls and control mechanisms that can be implemented based on the guidelines from ISO 27001.
- ISO 27003: intended to offer guidance for the implementation of an ISMS
- ISO 27004: covers information security system management measurement and metrics
- ISO 27005: the methodology independent ISO standard for information security risk management
- ISO 27006: provides guidelines for the accreditation of organizations offering ISMS certification.

The standard has gained international acceptance and been used globally to assist organization to build and enhance their Information security management system. (BSI Group, 2010) (The ISO27000 Directory, 2009) (Tarn J.M. *et al*, 2009)

E. ISO/IEC 38500:2008 Standard

ISO/IEC 38500 is one of the most recent international standards created to guide in having effective corporate ITG practices. It provides broad guiding principles and a framework of practices for ITG issues within an organization to provide effective, efficient and acceptable use of IT in an organization. ISO/IEC 38500 is based on the Australian Standard AS 8015 where it considers ITG as a major element of overall CG. The objective of ISO 38500 standard is to provide a framework of principles for managers to use when evaluating, directing and monitoring the use of IT in their organizations (ISO/IEC, 2008). The framework is composed of definitions, principles and a model. It identifies six principles for good ITG:

- Principle1: Responsibilities: Establish clearly understood responsibilities for IT
- Principle2: Strategy: plan IT to best support the organization
- Principle3: Acquisition: acquire IT validly
- Principle4: Performance: ensure that IT performs well, whenever required
- Principle5: Conformance: ensure IT conforms with formal rules
- Principle6: Human Behaviors: ensure IT use respects human factors

In addition, it supports the use appropriate mixture of standards to fortify their ITG practices and needs. One main strength of ISO38500 is that it is applicable for all type of organizations (public, private, government, not for profit) and to all organization in term of size from the smallest to the largest, regardless of extent of their use of IT. Furthermore, it is mapped to the Cadbury report and OECD principles of CG (ITGI, 2009 C). Figure 2.4 represents the model of corporate governance of ICT followed by ISO/IEC38500.

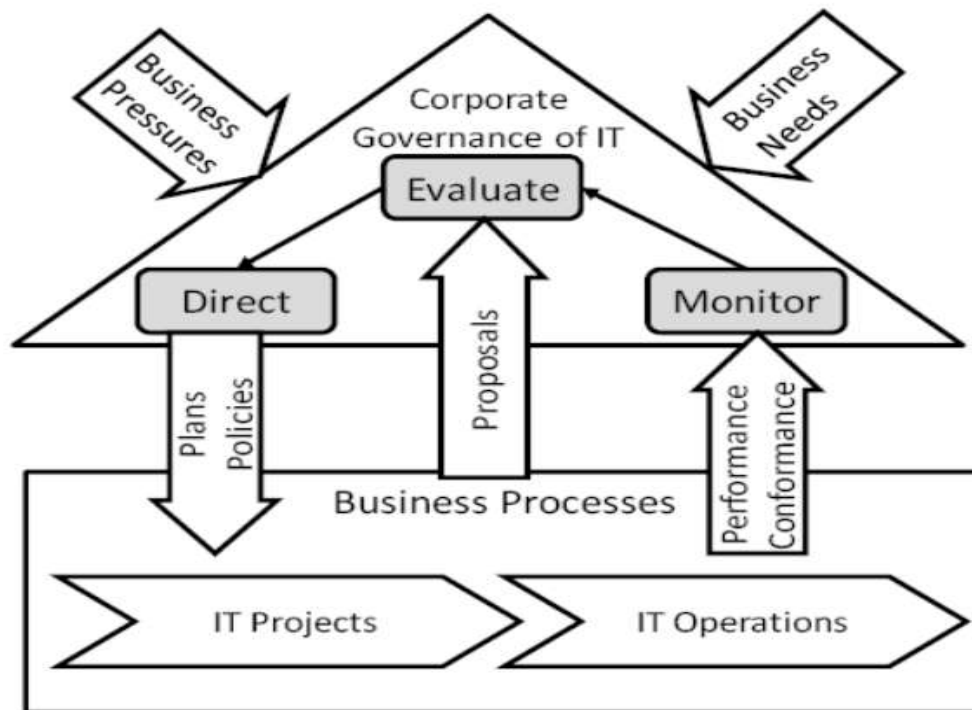


Figure 0.4 –ISO3800 Governance of ICT framework (Source,ISO/IEC38500, 2008)

The model suggests that ICT or IT governance should be done through three main elements as presented in the diagram. First, evaluating the use of ICT according the business needs and considering the business pressures. Second, directing the preparation and the implementation of plans and policies. Third, monitoring the conformance and compliance with policies and monitoring performance against predefined plans. All three elements are part of an ongoing life cycle.

F. Weill & Ross Model

Weill & Ross model and Symons model will be presented although they are not standards; however they have gained substantial attention and been referenced by most researchers in the area of ITG. They are considered as a new startups in the area of ITG especially Weill & Ross model which is based on a large field study that provided new direction to the field of ITG.

Weill and Ross model (2005), in their study of ITG, studied 250 organizations in 23 countries and came up with the main conclusion that ITG main topic is IT decision rights and decision making structure. They came up with a model where they map six mutually exclusive

organization structures; they called it archetypes, against five key IT decision areas. They have also addressed several organization contingencies. Each of the six archetypes can hold decision rights or input rights to each of the five key IT decision areas. This was represented in a matrix of IT-decisions and archetypes (Table 2.1). The matrix and the ITG framework, try to provide organizations with a simple tool for deciding on the best ITG decision making structure. This is because Weill and Ross, based on their field study, considers the most important aspect of ITG is the decision making structure.

Table 2.1 matrix of IT-decisions and archetypes (Source, Weill and Ross, 2005)

		Decision Domains									
		IT Principles		IT architecture		IT infrastructure strategies		Business application needs		IT investment and prioritization	
IT Governance Archetypes		Input	Decisions	Input	Decisions	Input	Decisions	Input	Decisions	Input	Decisions
	Business Monarchy										
	IT Monarchy										
	Feudal										
	Federal										
	Duopoly										
	Anarchy										

After identifying the current IT organization type, the next step is to adopt one of the five decision-making archetypes for IT investments, as illustrated in the proposed matrix.

- Business monarchy

This decision making type best fit to a centralized IT organization. In business monarchy, business executive or a group of senior business executives, it might include the chief information officer (CIO) sometimes, as members of an executive steering committee. They are responsible to make all the IT decisions affecting the entire organization.

- IT monarchy

In an IT monarchy archetype, IT related decisions are solely taken by an individual IT executive (ex. CIO) or a group of IT executives with no business representatives. IT monarchies decide on

most of the organizations IT architecture and infrastructure decisions. Most common implementations of IT monarchies as governance structures are IT steering committees and architecture review boards.

- Federal:

The federal IT decision making archetype involves a coordinated decision making process involving business executives and business unit representatives collaborating with IT department to decide on IT related decisions.

- IT duopoly:

This is a two party decision making approach that involves IT executives and a group of business units executives. Common implementation of IT duopoly as governance structures are IT governance boards and IT strategy committees.

- Anarchy:

This archetype is the most decentralized archetype where each individual or small group makes their own decisions based only on their local needs. This approach is used whenever a very quick responsiveness is needed to satisfy local or individual customer requirements (Weill and Ross, 2005).

G. Symons Model

Symons ITG model is based on three main elements structure, process and communication. He believes that a good ITG model should cover these three elements for the following reasons (Symons, 2005):

- Structure

It is mainly about the organization structure, the decisions making structure and who make and participate in ITG decisions. It also includes the identification of clear roles and responsibilities. As Symons describe as the *Who* of ITG.

- Process

This is the *How* of ITG. How IT decisions such as technology, investment and infrastructure decision take place. It looks whether there is a process for decision making and what is it. It also includes how these decisions being prioritized and reviewed.

- Communication

It is the monitoring and control of projects and decisions. It also include the communication of IT decisions and performance to all parties including top management shareholders and staff.

In addition, Symons proposed a maturity model (Table 2.2) that indicates the current status or level of IT governance practices.

Table 2.2 - Symons ITG maturity levels

IT Governance Maturity Model		
1	Ad Hoc	Ad hoc governance practices. There are no formal processes or mechanisms; It's essentially everyone for themselves
2	Fragmented	There have been some efforts to formalize IT governance practices, but they are fragmented across the enterprise.
3	Consistent	There is formal IT governance process in place that is being practiced consistently across the enterprise.
4	Best Practice	IT Governance has been practiced for some time and has evolved to represent best practices. Companies employing IT governance best practices tend to have an optimized IT portfolio.

Symons proposed four key objectives that drive IT governance within organization striving for excellence. These are:

- IT value alignment
- Risk management
- Accountability
- Performance measurement

Symons also discussed ITG forms where he believes for any attempt to apply certain ITG practice; it is important to understand the organizational structure and specifically the IT function structure. He presented following ITG forms:

- Centralized:

In centralized ITG structure, all IT related decisions and authority are located in a single place. Normally it is easier to manage with less effort. The head of IT or CIO interacts directly with the organization executives and is the lead in setting the governance policies and processes. The drawback for centralized IT organizations is to ensure that all organization business units have input in setting these process related to them. This is difficult since all the decisions and control is in hand of IT. Otherwise all decision will be monarchy for either IT or non IT people.

- Decentralized:

In decentralized governance structure, each IT function develops its own IT governance arrangements and processes. IT investment decisions could be done at the business unit level. This might result in duplicated systems, applications, resources with little sharing of resources. As a result, higher expense and more operational cost in functions which can be optimized in case of proper resource utilization.

- Federated:

This structure is hybrid somewhere in between centralized and decentralized IT governance structures. Organizations adopting this structure will combine centralized and decentralized approaches. In such arrangement high cost, infrastructure, core enterprise functions can be centralized and shared across the organization while business units can keep control over their specific IT systems or solutions and resources which represent a decentralized structure. This mixture attempts to combine the benefits of the two basic structures. The central control will result in reducing the cost for enterprise wide solutions and keep the business unit related solutions with them allowing more flexibility. The drawback of federated ITG form is to follow the enterprise architecture standards and at the same time balance the requirements of business units.

- Project based:

This ITG structure is also a new structure. It forms a centralized structure in the sense that all IT resources are centrally located and report to one CIO; however it is different in the application development side. This organizational structure is based on something called resource pool or competence centre which consist of a group of similar resources lead by resource or competence centre manager. In this structure, performance is measured based on resource utilization where those resources are loaned out to several projects based on needs and requirements. The

challenge here is how to properly manage those resources allocations and to have strong governance mechanisms to ensure the selection of right projects to fund it properly.

In addition, Symons concentrated on the idea of using a combination of practices and models based on the needs to achieve required maturity of ITG as he says *“Don’t be afraid to borrow pieces from each of these when developing your own IT governance framework. If you are concerned about your risk management and compliance posture, lean heavily on COBIT. If service delivery is challenging, have a look at ITIL. If security is an issue, be sure to look at ISO 17799”* (Symons, 2005).

After presenting a sample of widely recognized ITG practices each by itself, it is important to discuss them all together to compare and contrast. This will be done in the next section.

2.3.3 Discussion and Analysis

Each model, standard, or framework has its own advantages and disadvantage for example COBIT is more focused on compliance and control mainly from an IT audit perspective however it lack the elaboration at the details of implementation part. In addition, COBIT tried to avoid this weakness by presenting a group of guiding documents that map COBIT to other mature frameworks or models that are strong at the details and implementation side. However, the use of all these documents showed some sort of difficulty and complex process especially for small organizations (Tuttle and Vandervelde, 2007; Abu-Musa, 2009). On the other hand, ITIL is more focused on the details of how you do it at detailed process level rather than COBIT which is more into where you should be. Both standards can complement each other for better results (Pultorak and Kerrigan, 2005). The CMMI is very good process improvement and measurement which made it utilized by COBIT and other standards as a mean to set maturity levels which allows management to decide their current level and easily how to get to the next or the proper maturity level. However, when applying CMMI, which is quit a large framework, to small organizations; it will be a complicated to understand and a costing attempt. There are other simpler frameworks that can be efficient for such organization such as Six Sigma and PRICNE2 (Griffiths , 2005). ISO27001 is mature ISMS standard which has gained a wide acceptance for being clear and straightforward, however it does not provide management with measurement to decide how much security is in place or need to be accomplished in a way that is similar to what we have in CMMI maturity levels. ISM3 is a new standard that identified this issue and built an

ISMS model based on five maturity levels similar to CMMI approach.(Siponen, 2008) (ISM3,2010).

As proposed by more than one researcher, there no single ITG models that fit to every organization. ITG is recommended to be deployed using a mixture of ITG practices, According to De Haes and Grembergen (2009) *“business/IT alignment maturity is higher when organizations are applying a mix of mature IT governance practices”* (De Haes and Van Grembergen, 2009). In addition, Gad J. Selig, (2008) described it as *“To establish and successfully deploy an IT governance initiative effectively, it must permeate the enterprise, and can be characterized as a mix of formal systematic processes blended with behavioral science techniques and people skills”*. Therefore, it is always advised that each organization should continually study and identify their current situation and future requirements and accordingly build or modify their ITG arrangements from a applicable group of standards that are satisfying their needs (Peterson, 2004; Weill and Ross, 2005; De Haes and Van Grembergen, 2009; Selig, 2008).

So far the presented ITG practices are considered single view approach; however another ITG models emerged based on the researchers and practitioners recommendations to use more than model or framework to build what can be called as complete ITG arrangement. I will categorize these as integrated models or frameworks which will be presented next.

The use of multiple standards as basis for your own customized ITG framework will allow not start from scratch rather than completing from a certain stage or level based on needs and plans. Integrated frameworks are composed of a group of ITG standards, frameworks and best practices. In this direction researchers built their new models based on previous standards where have studied each of the common mature practices such as COBIT, ITIL, ISO27001 and others to identify each one strength and weaknesses. Then they came up with frameworks to help organization better select the right model to take from and how map each one to the other allowing them utilize strengths and overcome weaknesses. We are going to present three models that are based on integrated approach; PAINLESS model by Parfitt & Tryfonas (2009) and The Generic IT Governance Model by Gad J. Selig (2008). Others built a guideline framework to help in selecting the right combination such as Calder-Moir ITG framework (2009).

H. Calder-Mior framework

Calder-Moir ITG framework is described as a meta-model for coordinating frameworks and organizing ITG (Calder and Moir, 2009). It was mainly designed to assist organizations to implement ISO/IEC 38500 while at the same time drawing intelligently on all other available frameworks and standards. (Figure 2.5) demonstrates a graphical representation of the framework. The framework is divided into six segments where each segment represents a part of the framework end-to-end process. Starting from Business Strategy segment and finishing with Operations segment, each segment is divided into three layers where the inner most layer represents the board (direct, evaluate and monitor IT), the middle layer representing executive management (manage the activities to deliver the end-to-end processes) and the outer most layer represents the IT and ITG practitioners (employ the proven tools and methods to plan, design, assess and control the IT support for business). In their book Calder and Mior (2009) provided the following recommendations for using a mixture of models and standards:

- *That COBIT should be used to provide an overall control framework based on a generic IT process model defining what should be done at the governance high level.*
- *The mapping of ITIL and ISO27002 requirements to high-level COBIT processes and control objectives.*
- *The ISO27002 definition of what must be done in terms of information security*
- *The ITIL descriptions of how the different aspects of service management should be handled.*

Although these cross-mappings are subjective to some extent, every organization must tailor and adapt the best practice guidance to meet their specific unique environment and requirements.

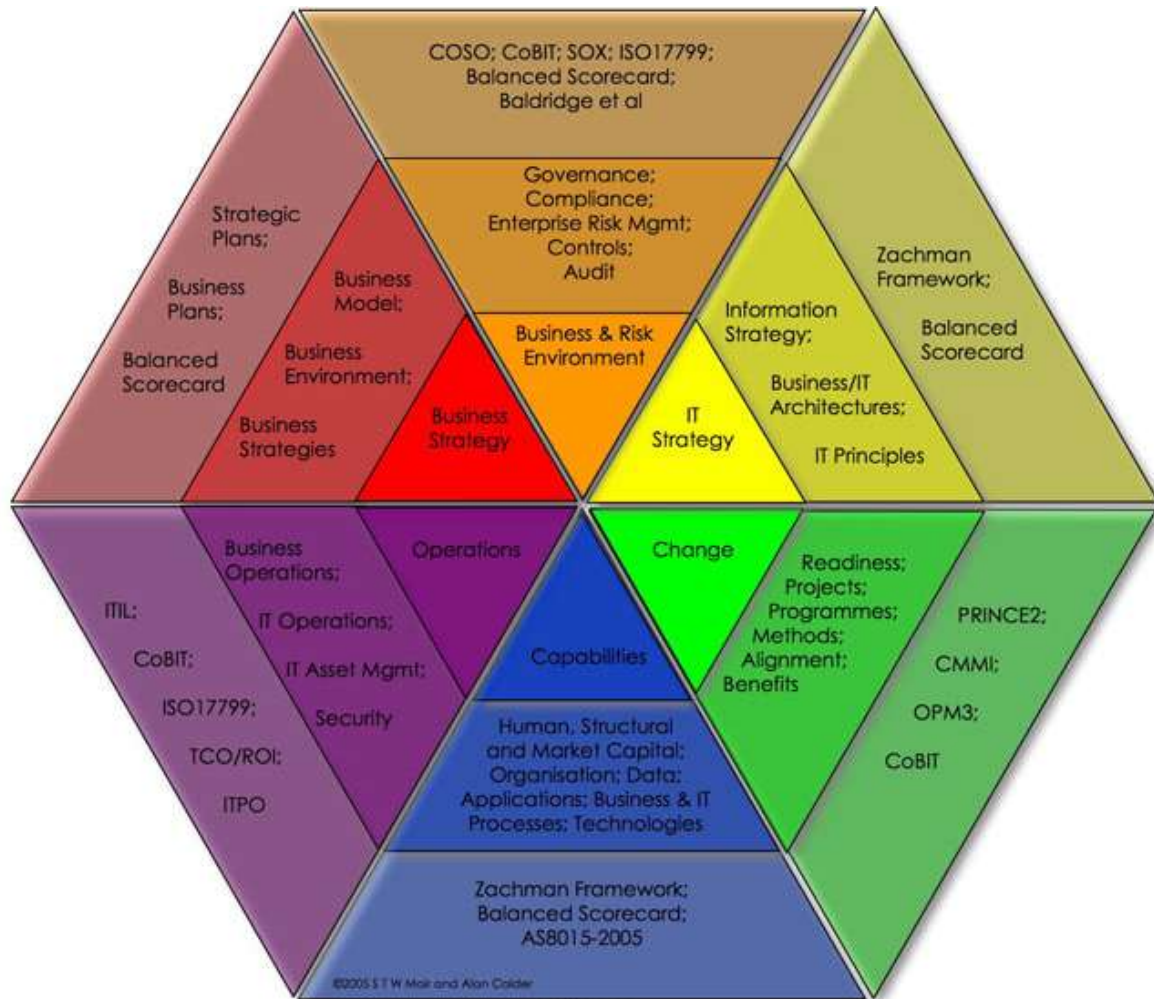


Figure 0.5 - Calder Mior Framework (Source, Calder and Moir, 2009)

i.PAINLESS Model

PAINLESS model is an integrated model designed as a capability assessment model for ITG practices that was developed by Parfitt and Tryfonas (2009). Based on their research, they have extracted eight key features that they believe sum up the critical elements of an ITG model. These key elements are expressed using the PAINLESS acronym as shown in table (2.3). Each of these key elements has been further developed to provide a set of maturity indicators, similar to CMMI model, where ITG processes can be assessed against. These key eight areas were borrowed, derived or built from a certain or a combination of framework/s, guidelines and ITG best practices. In general, the model presents a tool that attempts to provide an overall view of almost all aspects of the current ITG practices within an organization with its maturity level.

PAINLESS model was mainly designed to address the ITG requirements of the Welsh Assembly Government in United Kingdom, however as stated by Parfitt and Tryfonas, with very little modification it can be used elsewhere. It provides an easy tool to assess and measure continuous improvements of ITG procedures in an organization.

Table 2.3 PAINLESS Model

PAINLESS	The PAINLESS Capabilities as Key Features	Based on
P	Project and program management capability criteria	CMMI model
A	Alignment of business and IT capability criteria	Sabherwal and Chan (2001)
I	Information security and risk strategy capability criteria	Information Security Management Maturity Model (ISM3)
N	New applications/technology/operating platform capability criteria	Combination
L	Legislative/regulatory compliance and awareness capability criteria	Combination
E	Evidence of performance metrics and monitoring capability criteria	Combination
S	Senior management commitment and accountability criteria	Combination
S	Standards and policies deployed throughout organization capability criteria	Combination

J. The Generic IT Governance Model:

The Generic IT Governance Model by Gad J. Selig is another attempt in the direction of the integrated approach where in his book “Implementing IT Governance: A Practical Guide to Global Best Practices in IT Management”, he nailed down almost all recognized ITG models and practices indentifying each one strengths and weaknesses and then mapped them together to build his integrated model. After defining his model approach, he presented a detailed implementation road map plan with a list of guidelines to help in this process. In his book divided ITG into two main areas:

- Demand Management and Alignment

As he describes it, it is the ‘*Why*’ and ‘*What*’ of ITG. It includes IT & business objectives and strategic planning management, defining performance metrics and management, portfolio investment management, and decision authority and approvals management.

- Execution & Delivery Management

It includes the detailed of ‘*How*’ of ITG. It covers subjects such as project management, policies, standards, guidelines and processes. In addition it includes other subjects such as IT service management, strategic sourcing & outsourcing, tracking measurement metrics, Risk and Contingency Management.

- Resource and continuous improvement Management

It covers subjects including leadership and management & human capital development. In addition, it talks about continuous improvement, learning and managing change and transformation.

Selig (2008) presented road map for his integrated ITG framework presenting a list of major components for ITG that every organization must address:

- Business strategy, plan and objectives (demand management)

This is part of demand management and it involves developing the business strategic plan that drives the IT strategy and plan.

- IT strategy, plan and objectives (demand management)

It is also part of the demand management and it reinforces that IT strategy and plan should be based on the business strategy and plan. In this way, IT investment and resources utilization priorities will be directed by business strategy and direction. It will also include the decision making structure and authority distribution.

- IT plan and service execution (execution management)

It is part of the execution management and includes the required processes to guide the execution side of IT systems and services. It should cover areas such as project management, IT service management, risk management, change management, security management, business and IT continuity, contingency, disaster recovery management and others.

- Performance management, management controls and compliance (execution management)

This is also part of execution management but from the measurement and control side. It would include areas such as the Balanced Scorecard (BSC), Key performance indicators (KPI), and COBIT. It would also cover compliance areas such as legal (SOX, BASEL II, HIPPA,) and other industry specific regulations.

- Vendor management and outsourcing management (execution management)

This is also part of execution management and it emerged based on the increasing dependence on outsourcing options. Therefore, proper selection and management for the service providers is an increasing critical issue. It will include multiple areas in outsourcing such as selection, control and SLA management.

- People development, continuous IT governance process improvement and learning

In this section of the roadmap, it concentrates on people learning and knowledge development and management. This is very important to stay ahead in this competition and continuous process improvement.

Figure 2.6 presents an illustration for Selig (2008) Integrated ITG model with its major components.

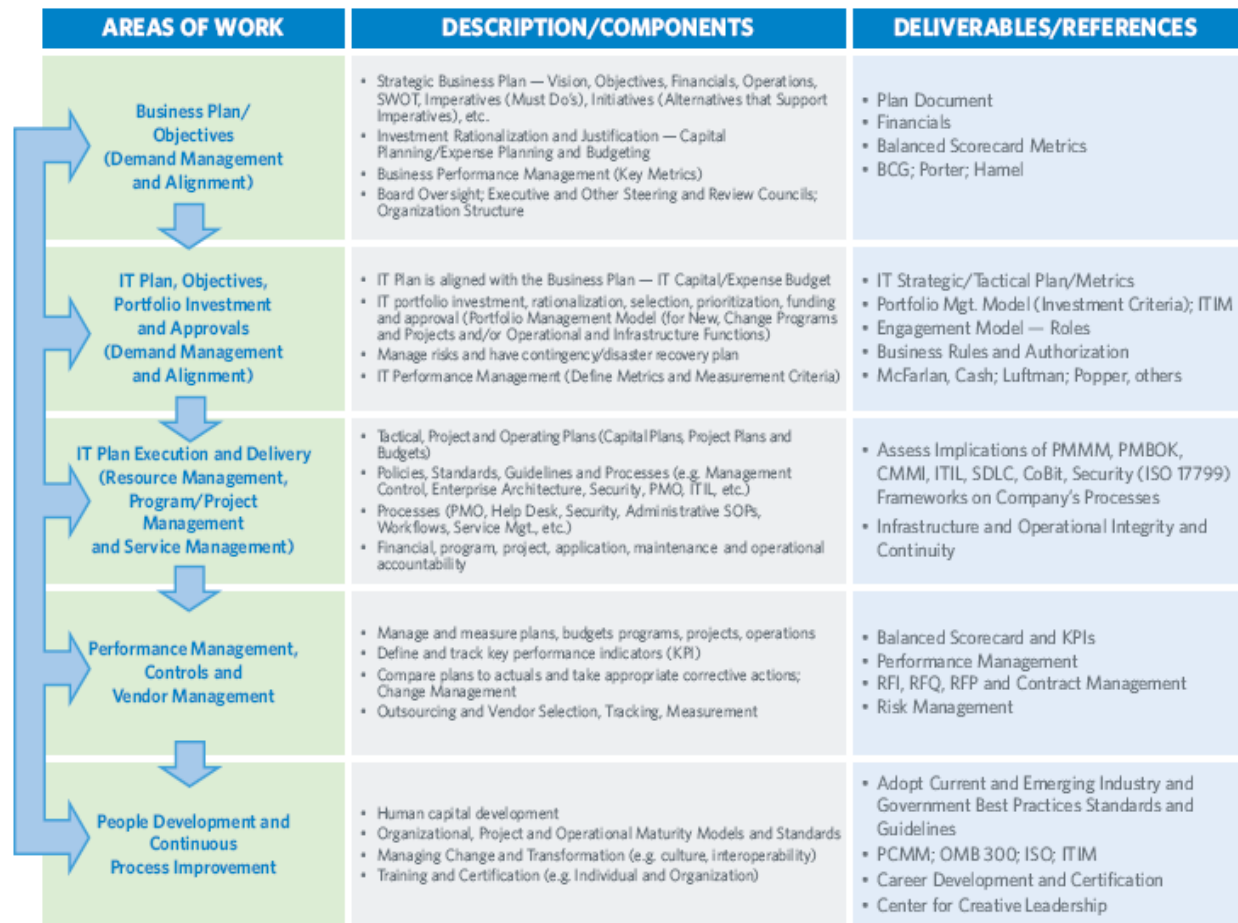


Figure 0.6 The Integrated ITG model with its major components - Selig (2008)

The integrated ITG model covered almost all ITG areas in addition to a new subject that was not discussed by other researchers which is human capital management. This subject is very critical and most of the time it is handed to the Human Resource department, however part of IT strategy should be the development of their people to keep up with the coming systems and industry development. In this model Selig referred to a group of standards, practices and even academic research models to build his integrated model.

Moreover, although he came up his integrated model he point that the selection of a certain ITG framework or combination of frameworks mostly depends on the organization strategic objectives, available resources and their intended results. Organization must tailor the selected framework or approach to its environment, current maturity level and issues to be addressed along with other organization specific affecting factors. In addition, for any ITG implementation

a change management and cultural transformation plan is vital to achieve the most of it (Selig, 2008).

After viewing the integrated models approach, again determining the right ITG mechanisms is practically complex task as it depends on the organization itself, its internal and external factors. Any organization around the world has its own unique identity and different structure, needs and requirements (Heera & Chang, 2008). Organizations must make effective ITG arrangements if they seek to succeed in this dynamic environment. They must make sure to cover all aspects of ITG to assure integration and synergy of all functions and capabilities (Selig, 2008). The literature identified a group of standards, frameworks and best practices that are being widely used to help in implementing effective ITG practices. The question that arises again here is which ITG model organizations should adopt to have an effective ITG? The answer is there is not right answer and there no one fits all solution.

In my research I will be aiming to answer this question in a different way. As one of my research objectives is to extract a list of critical success factors (CSF) for an effective ITG model instead of selecting which ITG model or framework is best. This will be the topic in the following section. I will be going over past literatures to identify their main principles and critical success factors they identified that most possibly lead to an effective ITG practices.

2.3.4 ITG Critical Success Factors (CSF):

As presented earlier, there is no ultimate framework or solution the fit all. In this section, I am going to extract a list of what can be considered as the critical success factors (CSF) that an effective ITG arrangement should cover. These CSF will allow making sure any selected ITG approach doesn't miss any of the main key factors to have an effective ITG. In this way, organizations can use these CSF to measure current ITG practices in general and thereby seek improvements in their current framework either from current model or utilize other frameworks to achieve the needed.

Based on the literature review, researchers attempted to identify these principles that should identify an effective ITG model. However, it should be clarified that these principles do not provide a comprehensive figure for ITG. Firms need to select or adjust their frameworks

according to their objectives and needs. Weill and Ross, (2005) identified ten principles for good ITG for optimizing the effectiveness of ITG presented in Table 2.4.

Table 2.4 Ten Principle for good ITG (Weill and Ross, 2005)

Principles of Good Governance	Description
1. Actively design IT governance	IT Governance should be actively designed according to the organization's strategies and goals.
2. Know when to re-design governance	Governance redesign should be infrequent, since changing the whole governance structure in any organization may require a lot of time and resources.
3. Involve Senior Managers	IT Governance is more effective when senior management/CIOs are involved. Some organizations use their management committee structure to improve IT Governance and thus obtain better integration across organizations.
4. Make Choices	IT Governance involves making choices. Clear business principles help to better handle goal conflicts and hence better selection of alternatives.
5. Clarify the Exception-Handling Process	Exceptions, in relation to IT, challenge the current situation, particularly IT infrastructure and architecture. IT governance must include a clearly stated exception-handling process to bring open discussion about the issues, and foster organizational learning. Exception handling is important to manage technical risk, track the emergence of non-mainstream technologies, and ensure architecture flexibility
6. Provide the right incentives	Rewards and incentives must be aligned in order to maximize the effectiveness of IT governance. Employees tend to show more interest in their firm's objectives when they are rewarded or provided with incentives.
7. Assign Ownership and Accountability for IT Governance	Ownership of IT governance design, implementation and performance must be delegated to a person or group of individuals within a firm. The CIO may be responsible and accountable for IT Governance mechanisms, decision-making, decision implementation and performance.
8. Design Governance at multiple organizational levels	This principle is mainly useful and applicable for multi-business unit firms, where governance is considered at several levels. Lower levels of governance are most likely to be influenced by

	the mechanisms designed at higher levels.
9. Provide transparency and Education	Higher transparency in governance processes, leads to better understanding and trust in the IT governance. Higher communication within firms promotes more effective governance.
10. Implement common mechanisms across the six key assets	The six key assets are: Relationship, Human, Product, Information and IT, physical and Financial assets. IT Governance must provide mechanisms for effective governance of the assets.

In addition Calder, (2005) stated that whenever possible organizations should seek to make their ITG framework as simple as possible. He developed a set of characteristics for an ideal ITG model:

- It requires and depends on Board leadership and the kind of leadership that is knowledgeable, balanced, judicious, and entrepreneurial.
- It requires and depends on executive execution, the CEO and business leadership have to turn the Board's business and information strategies into a set of processes, goals, and actions that realize the business goals.
- It empowers the organization's intellectual assets for competitive advantage and must ensure that technology is a positive, not a negative, differentiator for the organization.
- It ensures proper risk management that all information and IT risks that the organization will encounter are effectively identified, managed, and controlled.
- It ensures compliance that there are no unexpected or unplanned regulatory, statutory, or contractual exposures.
- It ensures that IT projects deliver added value benefits rather than destroy value.

Symons, (2005) believed that there is not necessarily one right IT governance framework and that governance frameworks must work within the context of an organization's structure, culture, and strategy. He proposed that every ITG framework must address three things: governance structures (the who of IT governance), governance processes (the how of IT governance), and governance communications to measure and communicate performance of the overall ITG efforts (presented in section 2.3.2.G).

In addition, Symons suggested some recommendations to have a successful IT governance implementation:

- Executive buy-in is essential:

Once the decision is taken to develop a framework for good IT governance, the first step is to get buy in from the board of directors and executive management, since IT governance is a subset of enterprise governance. This buy-in will assure continues support and collaboration to accomplish the planned objectives.

- Develop structures first:

It is important to develop the governance structures first. If the CIO is not at the executive level, doing this can be first. For example, appoint an IT steering committee to review, approve, and prioritize IT investment, and an architecture committee to develop, communicate, and enforce enterprise architecture and IT standards.

- Develop processes next:

Adapt an IT portfolio management process for comprehensive, enterprise wide investments. This can be followed with a demand management process, SLAs (Service Level Agreements) and chargeback mechanisms.

- Don't start from scratch:

Some of the useful existing frameworks include COBIT, ITIL, and ISO 17799/27001. It is possible to select parts of each framework if it fits to your requirements which will help in developing your own IT governance framework. For example, COBIT is more concerned about risk management and compliance posture, ITIL help solving service delivery challenges and ISO 17799/27001 will provide great help in Information security and Information security management system.

- Communicate:

This is an important aspect because ITG must be explained and continuously reinforced. Furthermore, it must be measured to determine what impact it is having. The balanced scorecard technique is recommended to be adopted as the primary performance measurement and management methodology for ITG. (Symons, 2005)

The ITGI board briefing on ITG, (2009) defined five main elements that ITG must cover. All driven by stakeholder value, two of them are outcomes: value delivery and risk management.

Three of them are drivers: strategic alignment, resource management (which overlays them all) and performance measurement. They also state that ITG is a continuous life cycle that could be entered from any point and span around stakeholder's value.

- Strategic alignment : focus on aligning with the business and collaborative solutions
- Value delivery: concentrating on optimizing expenses and proving the value of IT
- Risk Management: focus on that all IT and organization assets risks are properly identified, managed and controlled.
- Resource Management: focus on optimizing knowledge and IT infrastructure and Last one where none of these factors can be managed appropriately without.
- Performance Management: used for measurement and tracking project delivery and monitoring IT services.

In addition, the ITGI board briefing on ITG came up with three main recommendations for ITG implementation:

- ITG should be integrated within enterprise governance: since IT is an integral part of the business, IT governance should be an integral part of enterprise governance.
- ITG roles and responsibilities need to be defined: roles and responsibilities should be defined for committees such as IT strategy committee, IT steering committee, technology and architecture committees. Defining their roles and responsibilities will assist in the implementation of IT governance.
- An ITG implementation plan is required: To get the IT governance initiatives headed in the right direction, the organization needs to have an effective action plan that suits its specific needs and objectives.

Moreover, Selig (2008) identified three main pillars for an effective ITG arrangement. First one is the leadership, organization and decision rights (concerned with defining the organizational structure, roles and responsibilities and decision making structure). The second is having flexible and scalable processes (processes should be well defined with control measures, processes linked to organization processes that avoid silos and should be flexible and scalable due to dynamic environment changes and changing needs). Third is the use of enabling technologies (concerned

with the use of best tools to help and support with ITG key areas such as project management, investment management, control and performance measurement).

Discussion:

Going over mentioned principles and CSF for effective ITG, we can see them sharing many similar principles which enforce their importance. Also, other principles were unique to one researcher or standard. To summarize the main principles for ITG that can construct what we can consider as CSF that any ITG framework should cover or at least consider leading to an effective ITG practices.

CSF for and effective ITG practices:

1- Strategic IT Business Alignment

IT business alignment is an essential goal and a main driver for ITG. This was demonstrated in section (2.3.1) as part of ITG drivers. In addition, the importance of strategic IT business alignment is shared between all ITG practices (section 2.3.2) where alignment provides guidance for defining an IT strategy that is led by the business strategies. ITG needs to be dynamically designed and restructured to stay aligned according to organization requirements, objectives and overall strategy.

2- Executive management buy-in and continues support

To have an effective ITG, organization executive management buy-in and continues support is essential. This factor is considered the starting point for any initiative, therefore IT management needs to make sure organization top management are aware of the ITG practices and also aware of its benefits and added value. Showing measurable facts is key in this regard along with making IT awareness programs for top management. As explained by Weill and Ross (2005), IT being part of organization top management committees and IT strategy formulation part of organization overall strategy are of substantial importance in enabling and making ITG initiative more effective. This view was shared by ITGI, Symons (2005), Calder (2005) and Selig (2008).

3- Clear definition and allocation roles & responsibilities (the who)

As clarified by Selig (2008) (section 2.3.4), one of the main pillars for an effective ITG was the leadership, organization and decision rights which concerned with the clear definition and allocation of roles and responsibilities. In addition, Weill and Ross (2005) agree on the same where their framework is mainly about definition of roles & responsibilities and decision making structure which are authority distribution. The same was agreed on by Symons (2005) and ITGI. The same applies that ITG groups and committees need to be established with clear roles, responsibilities and authority.

4- Defined Policies, Procedures and processes

Policies and procedure should be clearly defined and documented to identify the rights and be used as a reference for all processes. As stated by Selig (2008) having clear defined and consistent policies, procedure and processes assist in making consistent outcomes as planned. It will also, assure a strong link to the business and IT objectives as it was planned. The same was agreed on by Symons (2005), ITGI and Weill and Ross (2005).

5- Communication and transparency

All involved parties need to be kept in the loop of ITG efforts; awareness programs need to be there at each level according to the role and level of involvement (Management level, staff level, IT staff, non-IT staff). Two-way communications and good participation and collaboration among the business and IT people are essential. This was clearly mentioned by Symons (2005) and Selig (2008) and the ITGI.

6- Resource management

Help to properly manage resources. Resources include human in terms of best utilization (innovation, development, knowledge management, training) and other normal assets such as systems in terms of efficient, consistent and effective use allowing minimum spent with maximum value (Symons, 2005; Selig, 2008; Calder 2005; Weill and Ross, 2005).

7- Risk Management

Risk management is one of the main drivers for ITG (section 2.3.1). ITG should ensure proper risk management to properly identify, manage and control any IT or business risks. There cannot

be effective strategic alignment without appropriate risk management. While strategic alignment mechanisms address the issue of creating value, the risk management mechanisms emphasize preserving existing value (Symons, 2005; Selig, 2008; Calder 2005; ITGI, Weill and Ross, 2005)

8- Delivery of business added value through IT

This is also one of the main drivers toward having effective ITG practices. It ensures IT meets business requirements and strategy and open new business opportunities and overall provide added value for IT investments for the organization (Selig, 2008; Calder 2005; ITGI, Weill and Ross, 2005)

9- Compliance to legal and organization obligation.

Compliance is considered the main driver for employing ITG practices especially in USA and Europe due to the legal regulation in this regard (section 2.3.1). Ensuring compliance with applicable internal and external laws, regulations, and standards providing Control and accountability assurance. (Selig, 2008; Calder 2005; ITGI, Symons, 2005)

10- Ongoing Performance Management

A prerequisite to improvement is measurement. In this respect, continuous measurement of ITG arrangements and execution is essential to fulfill the accountability requirements. All the presented frameworks concentrate on the control and performance management importance as part of ITG.

11- Simple, scalable and Flexible

As stated by Selig (2008), in his three main pillars for an effective ITG, an ITG framework should be simple which make easy to implement, scalable and flexible to cope with organizational changes and continuous needs in such dynamic world. The same was pointed by Calder, (2005).

12- Don't start from scratch

Symons (2005) stated this as a main principle of ITG. He stated that it is useful to use existing frameworks if it is applicable and help to satisfy the needs. It is recommended to select parts of well known frameworks, standards and best practices if it fits to the organization requirements which will help and guide in developing and customizing its own IT governance framework (section 2.3.3).

13- Integrated within enterprise governance

ITG needs to be integrated to overall enterprise or corporate governance system. This will assure IT strategy meeting organization strategy and ensures proper business IT alignment with top continuous management support since it will be on their CG agenda. (Selig, 2008; Calder 2005; ITGI, Symons, 2005)

14- ITG is a continuous life cycle

It is not a still state rather a continuous cycle of assessing, planning, implementing and reassess again to keep on-going improvement (Selig, 2008; ITGI, Symons, 2005; Weill and Ross, 2005).

15- Integrated implementation plan is required

This point was clearly pointed by Symons (2005) and Selig (2008); a clear implementation plan according to the agreed on organization needs to be in place. The plan should take into consideration all involved stakeholders. The plan should cover all above principles toward effective ITG and any other customization if needed.

In the above 15 points, I have analyzed previous literature and ITG practices on principles and critical success factors and grouped the most important principles which guide to an effective ITG. In addition, these principles should help in answering questions such as which ITG model or framework is most convenient for an organization or even if the existing framework needs to be further enhanced by including some of the mentioned principles or CSF.

Chapter 3

Case Study Context: ITG in Dubai

3.1 Introduction

As the case study will be in Dubai, a brief background about Dubai will help to give the reader an idea about the targeted scope and the surrounding context. Dubai is the second emirate of the United Arab Emirates (UAE). Over the last ten years, Dubai witnessed a remarkable economic development and growth where the real GDP growth was at a double rate since 2000 with an annual compound rate of 13% rate of per capita income with the fact of Dubai negligible dependence on oil (DSP 2015, 2007). Dubai's remarkable growth was driven by its strong leadership and multiple government initiatives in trading, investments, tourism, construction, real estate and the big support for the private sector. These investments were focused on property and attraction of foreign direct investments. This expansion was lead by a number of remarkable mega projects such as Dubai International Financial Centre (DIFC) as a new international centre financial hub, Burj Khalifa (the tallest landmark in the world), the palm islands, the multiple free zones (Dubai internet city, media city, healthcare city, industrial city), Dubai Metro (the world longest automated metro network) along with other worldwide joint ventures and investments in some of world leading companies and organizations such as DP world P&O deal and the NASDAQ OMX Group and others. These projects reflects the strong financial wealth and abilities in Dubai and UAE and its strong leadership where even during the recent financial crises which crashed the whole world it had less impact here comparing to what happened in US and Europe (Saidi, 2009).

Part of Dubai development and growth was the development and growth of its governmental organizations to a world class level. This was essential to handle all new rapid changes in the area to support Dubai's evolution and growth. As stated in Dubai strategic plan 2015 which concentrated on five main areas:

- Economic development
- Social development
- Infrastructure land and environmental development
- Security, justice and safety

- Governmental excellence

In the past few years, Dubai has made considerable progress in the development of public sector services and its overall performance. This was lead by the utilization of latest technologies and introducing the Dubai e-government project in 2001 to transform to computerized and online services (DSP 2015, 2007).

3.2 IT in Dubai

Dubai has identified the vital role in Information and Communication Technologies (ICT) in development. As a results Dubai was one of the first cities to deploy and utilize latest technologies in the region. This is clear in the multiple ICT initiative; one of first initiatives is Dubai Internet City (DIC) which is considered the regions first ICT free zone cluster lunched in 2000. DIC hosted a big list IT companies including the top IT companies internationally such as Microsoft, Siemens, HP, CISCO, Oracle and IBM. Another initiative is Dubai Silicon Oasis (DSO) lunched in 2004 to become a centre for electronic invention, manufacturing, research and innovation. On the other side, the lunch of Dubai e-government project in 2001 which helped to develop e-services in Dubai government sectors.

In March 2009, His Highness Shaikh Mohammad Bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE, has issued, in his capacity as Ruler of Dubai, law no 7 of 2009 establishing the Dubai e-government. This is considered a major transformation and a new stage in Dubai e-Government role where it entitled it the duties to develop the general strategy of the e-government aiming to accomplish the full e-transformation at governmental levels, design frameworks, policies and benchmarks for IT management and security. In addition, the e-government will also be responsible to deliver of e-services and the management of knowledge and human capital in accordance with the international best practices. Therefore it is anticipated that the new e-government is in its way to Identify and lunch new strategic initiatives to contribute to the development and management of IT from all aspects in all Dubai government organizations (Gulf News, 2009). Currently Dubai e-Government Department offers multiple fundamental electronic services to government entities and government employees through its website in addition to other eServices for citizens, residents, visitors and businesses through its public portal www.dubai.ae (dubai.ae, 2010). on the other side, almost all Dubai government

organizations provide online services and some of them reach a high level of providing more than 80% of its service online through their websites such as Dubai municipality, Dubai Customs, Dubai Courts and Dubai Land Department (Dubai.ae, 2010). This demonstrates the level of development in utilizing latest IT technologies to toward enhancing government services and excellence which is a key part of Dubai strategic plan 2015. In addition, Dubai government is and has been promoting the use of IT to enhance its services by adding “Distinguished E-Government Department” as a category of the Dubai Government Excellence Program which is an annual event to recognize and reward best excellence practices including excellence IT practices in Dubai government organizations. (dubaixcellence.com, 2010). The award is considered a major motivation in government organization competition in electronic transformation and innovation in IT.

3.3 ITG practices in Dubai

As demonstrated in the previous section, Dubai spent and continues spend a lot of efforts in promoting making best use and utilization of IT technologies. All this demonstrate the leading position of Dubai toward employing world class IT technologies. According to a recent report by the US-based global technology consultancy IDC UAE is forecasted to spend \$4.79bn on IT this year with an increase of 12.4% from the last year (arabianbusiness, 2010). The amount of investments allocated for these projects indicates the importance of proper management and control of such projects. Dubai takes a great care in making best use of any investment and to manage project in the best interest. If we recall the one of the definitions of ITG, The ITGI, (2009) defined ITG as *“IT governance an integral part of enterprise governance and consists of the leadership and organizational structures and processes that ensure that the organization’s IT sustains and extends the organization’s strategies and objectives”*. The definition points the importance of CG and that ITG is an integral part of it. Therefore if want to discuss ITG in Dubai then we should also discuss CG in Dubai.

Corporate governance in Dubai and UAE has improved noticeably over the past few years, driven by increased public governance and greater awareness of standards. However, according Euromoney research, (2007) on corporate governance in GCC, too much need to be done to have broader and better implementations to be able to construct the awareness that having good corporate governance standards and practices is an absolute obligation for sustainable growth

and development of companies and economies in our area. In addition, the recent financial crisis and its devastating impacts over the world revealed the lack of proper corporate governance and risk management practices as described by Dr.Saidi, *“In other words, the crisis originated from failures on three principal levels: the senior management level, board level and on the regulatory level. More fundamentally, it is about mal-governance and disrupting incentive structures”* (Saidi, 2009). Some of the reasons why any organization and especially Dubai must have good corporate governance practices along with the general benefits of corporate governance mentioned earlier in CG section (section 2.2.1):

- Dubai has many international investments and partnerships and having good CG will help to improve these relations.
- These joint ventures and partnerships with international companies obligate new rules and regulations that Dubai investment companies have to comply to.
- Having good CG is one of the main indicators for investment decisions and might be a prerequisite which shows the importance of having good corporate governance in supporting the efforts to attract Foreign Direct Investments (FDI).
- Good CG helps to sustain the development and growth of the company because it provides mechanisms for
 - o Better relations between owners, management and stockholders.
 - o Improved asset and resource utilization.
 - o Improved risk management practices.
 - o More satisfaction for all stockholders.

Regionally multiple efforts, initiatives, and professional associations were taken to develop and spread CG practices in the area for example, multiple institutions concentrating on promoting corporate governance practices and awareness such as Hawkamah, the Institute for Corporate Governance and MUDARA Institute of Directors. Also, several awards were established for successful implementations of corporate governance practices in the reign to promote these practices such as The UAE Banks Corporate Governance Awards and Hawkamah-UAB Bank CG Award. All these are located or started in Dubai which is considered a good indicator (www.hawkamah.org, www.hawkamahconference.org, www.mudara.org,)

On the other hand, there are ITG practices and initiatives in Dubai. These initiatives are lead by the Financial Audit Department (FAD) which is the supreme audit institution of Dubai. The FAD conducts regular financial, information systems and performance audits as part of their assurance in the compliance levels. FAD has early recognized the role of IT and the necessity to promote, formalize and improve ITG practices within Dubai. Therefore, FAD established the Information system/technology audit function since 2000 aiming to provide assurance on ITG practices and to promote the adoption of leading ITG practices within Dubai government organizations. Since then, the information system audit section of FAD adopted COBIT framework as their information systems audit methodology. In addition, most of FAD Information system audit section staff are members and certified professionals of ISACA which indicates the level of commitment professionalism toward promoting ITG practices. Since 2001, several ITG assessments has been undertaken for multiple entities by FAD based on COBIT framework which assisted Dubai government entities to get an indication of their current status. These ITG assessments promoted the benefits of enhancing the level of ITG maturity in Dubai government entities towards building and sustaining an effective ITG culture. A sample domain and overall compliance report would look as following figures (figure 3.1 and figure 3.2):

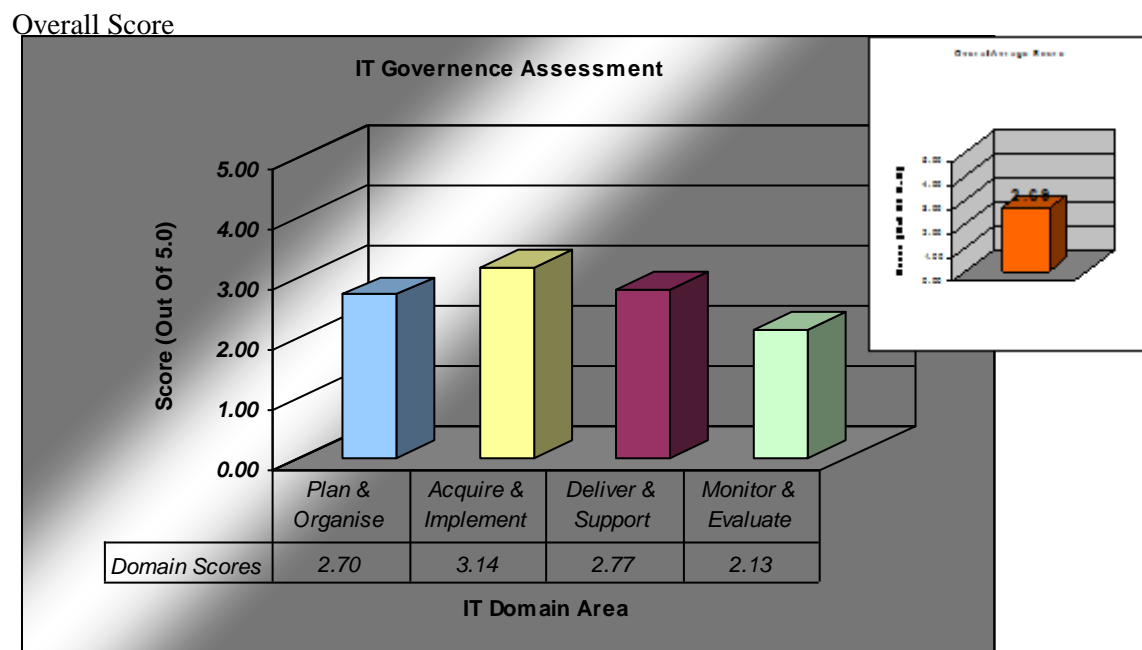


Figure 0.1- FAD COBIT Audit report sample (Source, ISACA, 2009)

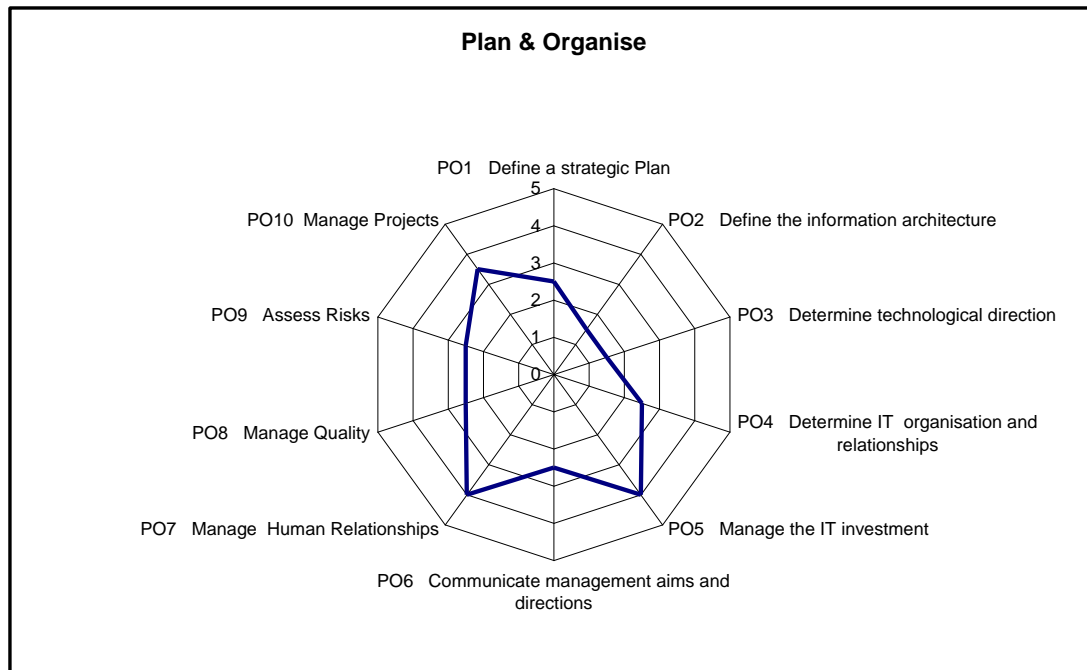


Figure 0.2 - FAD COBIT Audit report sample spider diagram (Source, ISACA, 2009)

Moreover, as part of FAD efforts and commitments toward promoting ITG practices in the Dubai, they have launched the Information Technology Governance Assurance Forum (ITGAF) in 2006 aiming to aid and promote the development of ITG practices among the Dubai Government entities in accordance with the leading international frameworks and best practices (www.ITGAF.ae). ITGAF was very active in the past period; they have been conducting conferences, workshops and trainings in ITG. In addition, ITGAF established the “ITGAF Process Maturity Award” aiming to reward and recognize IT departments among the Government of Dubai that demonstrates the highest level of ITG process maturity. FAD’s great efforts in promoting ITG practices in Dubai had been recognized by ISACA as an exemplary case study of how organizations around the world are customizing COBIT to their benefit. Furthermore, ITGAF/FAD has signed a Memorandum of Understanding (MOU) with the local chapter of ISACA in UAE in 2007 for collaborative efforts in the areas of promoting and improving Information system practices related to assurance, control, security and governance in the region. (ISACA, 2009; ITGAF, 2010; FAD, 2010).

In this section, I have demonstrated the background of IT and ITG practices in Dubai. It is clear that great efforts are taking place especially with government support. On the other, as discussed in

ITG drivers section (section 2.3.1), the benefits of having effective ITG is realized, top management support is in place and the legal framework to enforce ITG is coming into context. All these facts indicates that ITG practices deployment in Dubai is going forward and that further interest should be taken by organizations not employing CG and ITG practices due to the indications that a new CG regulation is going to take place which enforce the compliance side of ITG drivers.

Chapter 4

Research Framework and Methodology

4.1 Introduction

This chapter will present the research methodology where I will present the research design employed and the research instruments used or developed to meet the research objectives and research questions. I will be following the research onion methodology as per “*Research Methods for Business Student*” (Saunders *et al*, 2007) presented in figure (4.1). As depicted, I will present the research philosophy, approach, strategy, choices, and time horizon. First, I will be identifying the research questions and then extract the research objectives from research questions. In my research, I will be employing an inductive research approach and accordingly building the research strategy to reach my research objectives.

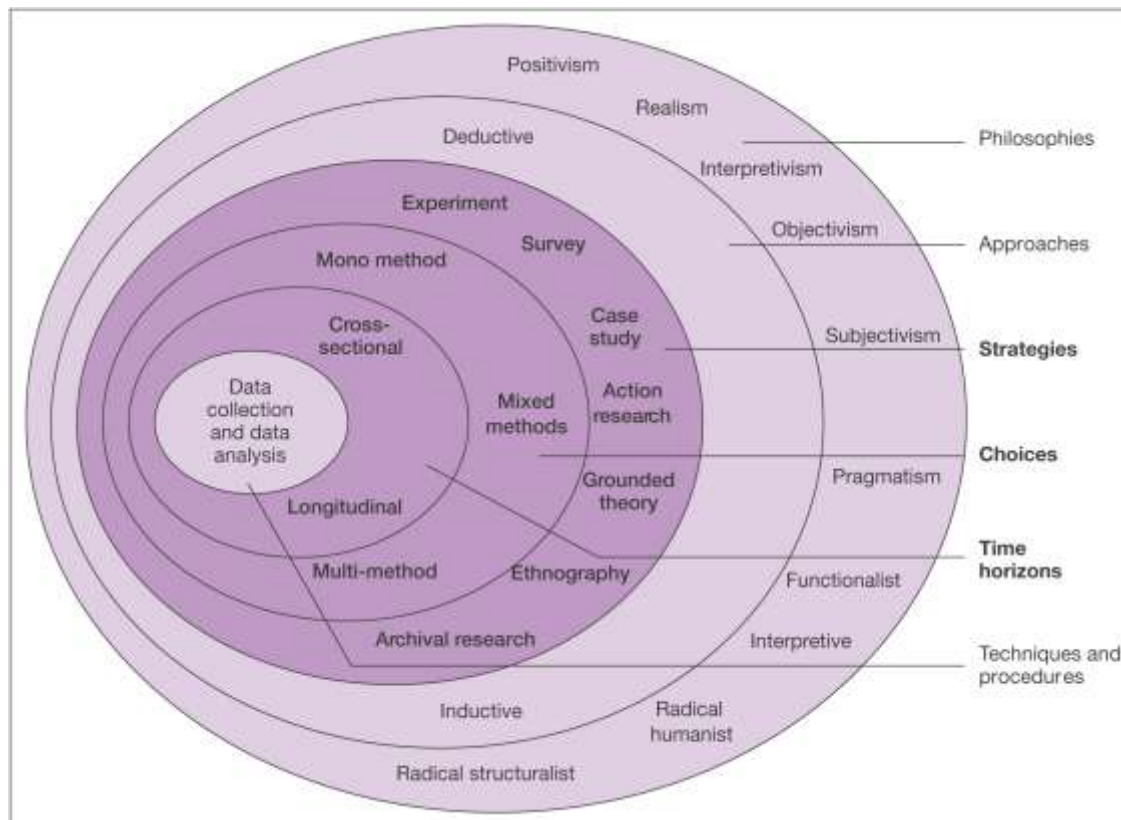


Figure 0.1 – Research Onion (Source, Saunders *et al*, 2007)

4.2 Research Questions

One of the most important steps in a research process is the identification of clear research questions. By defining clear research questions that are based on the relevant literature, it will allow the research to be more focused (Saunders *et al*, 2007). As I have progressed in my readings and gained more knowledge about the topic, presented in the literature review chapter, the research questions has been nurtured to be clearer and more focused to achieve intended objectives. In this research I will be exploring the concept of ITG, Its drivers and practices in the literature review. Then use the knowledge to explore and review ITG in Dubai Government. The Research questions are:

- How the concept of ITG is recognized, formalized, established and accepted in Dubai Government organizations?
- What are the current ITG practices (standards, frameworks, best practices) in Dubai Government entities?
- What are the drivers behind existing ITG initiatives in Dubai Government entities?
- What are the critical success factors for having good ITG practices?
- How do Dubai Government organizations see the relationship between ITG practices and achieving improved IT/business alignment?
- What are the difficulties Dubai Government organizations faced in applying ITG practices?

After defining the research questions; we need to identify the research objectives.

4.3 Research objectives:

Research objectives are derived from research questions which might generate other detailed research questions to identify a set of research objectives. In the research community, objectives are generally more acceptable as evidence for the researcher purpose and direction. Research objectives need to be SMART (Specific, Measurable, Achievable, Realistic and Timely) objectives (Saunders *et al*, 2007). The derived research objectives are:

- To investigate the extent to which the concept of ITG is recognised, formalised, established and accepted in Dubai Government organizations.

- Evaluate current ITG practices and identify the main drivers behind adopting or seeking to implement certain ITG practices in Dubai Government organizations.
- To identify the Critical Success Factors for effective ITG practices in Dubai Government Organizations.

Meeting these research objectives will allow my research to add up to the current studies in the field of Information Technology Management in Dubai. This will be accomplished by identifying current status of ITG practices, the gaps and suggestions based on my research. The aim is to help further develop ITG practices in Dubai Government. As I go through the research; I will be collecting more data about the identified research objectives. I will be seeking to address above research questions and objectives using multiple data collection methods to build the topic knowledge related to the research objectives which will be detailed as we go through this chapter.

4.4 Research Philosophy

The research philosophy is the first layer of the research onion. It is related to the development of knowledge and the nature of that knowledge. Based on the adopted research philosophy; the research strategy will be built and certain important assumptions will be taken which will support the research strategy and methods (Saunders *et al*, 2007). In general Saunders presented three main ways of thinking about a research philosophy: epistemology, ontology, and axiology. Each one has its own differences which will influence the way in which a research think about his research process, however we can't say that a certain type should be selected; it's just a way of thinking.

The research questions identified earlier will feed into the research philosophy. From our research questions, it's clear that I am seeking knowledge in the field of ITG and its practices in Dubai Government. This indicates epistemology type by looking at reality and tends to be objective nature. In addition, I will be looking for ITG critical success factors to improve ITG practices in Dubai. This indicates positivism philosophy type. On the other hand, I will be dealing with human factor and feelings in my case study interviews and meetings which are not easy to measure. These indicate the social factors that refer to the interpretive philosophy type.

After going through the research philosophy types, we will move to the second layer of the onion model which is the research approach.

4.5 Research Approach

Research approach is the second layer of research onion where researchers decide if they are going to build the research design based Deductive or Inductive approach. Deductive approach is more into scientific research where you develop a theory and hypothesis based on the research questions and accordingly build and design a research strategy to test the hypothesis. In deductive approach, the researcher should be independent of what is being observed. Therefore, mostly questionnaires can be used to collect the data without intervention with the sample. Other characteristics of deductive approach are the need to be measured quantitatively and generalization where to statically generalize about a certain topic, it is critical that the sample selection be of sufficient numerical size. In addition, deductive approach is criticized of its tendency to construct rigid methodology in a way that doesn't accept other explanations or options for the subject. On the other hand, in an inductive approach you will first collect the data and then develop the theory based on the results and analysis. The objective here is to first properly understand the situation by collecting information, meeting people, looking at the human factors and then reaching the conclusions after proper analysis based on the collected data. Users of inductive approach tend to work with qualitative data and use more than one method to collect data aiming to establish different viewpoints allowing more understanding (Saunders *et al*, 2007).

In this research I will be adopting an inductive research approach; I will start by collecting information about ITG from previous research, literatures, studies and experts through the literature review and then based on the collected knowledge I will be able to reach to identify the key findings that satisfy my research objectives. After that, I will be conducting a case study on a selected sample from Dubai Government organization to study them closely based on my research questions and objectives. As explained, the data sources will be the review of past literatures and researches, asking the field experts and interviewing the people matter in the indentified scope as a case study will be further detailed in the following sections.

4.6 Research Strategy

Research strategy is the third layer of the research onion where we decide on the strategy we are going to employ to meet the research purpose and answer the research questions. There are many research strategies that can be used such experiments, surveys, case studies, action research, grounded theory, ethnography, and archival research as presented in the research onion diagram (Figure 4.1). These should not be taken as separate items. They could be used in combination for the same research. In selecting the appropriate research strategy it is not important just to select single or multiple strategies rather than selecting the most appropriate one/s to answer your research questions and allow meeting your research objectives. Each strategy has its own advantages and most appropriate use filed. In the experiment strategy, the purpose is to study the natural and social science. It will be looking at different variables and the links between them. Experiments are used more in the exploratory and explanatory research types tending to look at the “how” and “why” questions. In general experiments are more into science and lab control testing and not very feasible with many business and management research questions. This is due that fact that you can’t for example, for ethical reasons, assign a real enterprise to experience lose to test your research questions (Saunders *et al*, 2007).

The survey strategy is another popular research strategy and mostly used in deductive research approach. It tends to be used for exploratory and descriptive research and mostly used in business and management research. One of its advantages is that it allows for the collection of large amount of data from a sizable population in the most economical way due to its nature as questionnaires directed to targeted sample. Survey strategy mostly uses to collect quantitative data allowing it to be analyzed quantitatively to find out possible relations and support a model or an assumption. In general, the survey strategy is quantitative and allows more control for the research process with lower cost; however it is limited to the written questions where you might not be getting insights to the main issue or objective. Another survey strategy approach to collect data is using structured interviews with pre-set standard questions that are asked to the interviewees (Saunders *et al*, 2007).

Case study strategy involves an empirical examination of a certain phenomenon or problem within its real life context using several sources of evidence. One main point about case studies is that there is no clear boundary between the problem to be studied and the context within its

being studied. This is key differentiator between a case study and an experiment. In an experiment, research is conducted under highly controlled context. The same applies to survey where it differs from case study in the context although both undertake a research context. However, in survey it is limited to the number of identified variables to be studied or asked about. Case study, allows you to get more insights about the subject matter and that why case studies are used for explanatory and exploratory research types allowing the researcher to get clear understanding of the research context and enacted processes. The data collection in case studies may include multiple methods such as interviews, observations, documentary analysis, and questionnaires. In case studies, it is preferred to use different data collection techniques to ensure that the collected data indications are the similar to what you think.

In my research, the research purpose tends to be exploratory, explanatory and somehow descriptive in nature. This is indicated from the research questions and research objectives formation and the fact that my research approach is inductive. In this research, I have selected case study as the primary research strategy. I will be interviewing a number of representatives from Dubai Government organizations IT departments through semi-structured interviews allowing collecting considerable amount of data about their organizations experience from the targeted sample population. Also, I will be using another technique by interviewing some subject matter experts in ITG also through a semi-structured interview as a secondary resource. This will allow me to get more insights from an independent third party. More details about the case study and interviews design will be presented in the following sections.

4.7 Research Choices

Research choice is the fourth layer of the research onion. It is concerned with the selection of qualitative and/or quantitative. It is mainly to choose between mono method and multiple methods. In mono method, researcher selects a single data collection and corresponding data analysis procedure, however in multiple methods researcher use more than one data collection technique and analysis procedure to answer the research questions. In my research, I am going to use multiple method and specifically multi-method qualitative study. This is because more than one qualitative technique are going to be used where I will be interviewing the organizations and also interviewing the expert (Saunders *et al*, 2007).

The main difference between qualitative and quantitative research are that qualitative data and mostly based on meanings expressed in numbers. In addition, quantitative data results are a group of numbers in a standardized way and quantitative data analysis is conducted through the use of diagram, statistics and computer programs by looking at numbers statistics such as the mean, maximum, minimum and regression analysis.

On the other hand, qualitative data is based on meanings and mainly expressed by words. Also, the collection results require classifying data into different categories. In addition, analysis on qualitative data requires the use of conceptualization. In general, qualitative data analysis starts by developing data categories, then distributing collected data into identified categories and investigating relationships within and between categories to reach results and conclusion (Saunders *et al*, 2007).

4.8 Research Time Horizon

The research time horizon is the fifth layer of the research onion. Research time horizon is about identifying the periods that this study took place in and the period data collection took place. This research will be cross-sectional where I will employ interviews case study to identify the current situation not the change through time interval. This is referred to as longitudinal time horizon (Saunders *et al*, 2007).

4.9 Sample Selection

For the research case study sample selection, it is clear from the research topic that I am looking at a specific target which is Dubai Government entities IT departments. Therefore, my research sample selection will be non-random sampling and specifically self-selection sampling where I will be targeting specific Dubai government organizations to meet their IT department's representatives. Limiting my selection to not include all Dubai government entities IT departments is due to the fact that not all entities have a complete or big IT department. Some entities only have IT help desk function and relatively limited IT functions where including them in the sample will not be sufficient. This is because such small and limited IT function will not have the need for detailed ITG arrangements in place. Regarding the selected organizations IT department representative, the research case study will be aiming to interview two representative one from IT top management level and the other to be from the middle IT department level. This

is to provide me with different point of views for the requested information which is in line with the qualitative data collection guidelines (sections 4.6 & 4.7).

The research case study will focus on certain main entities in Dubai Government that have a complete IT department. Nine Dubai Government organizations were invited to participate in the study; however five out of nine agreed to participate.

The concentration will be on those due to their importance and size in Dubai and the fact that they have considerable IT teams and IT infrastructure. Another reason is the cooperation I have received from them based on their cooperation and my personal connection there. It is important to mention that there are other entities with large IT infrastructure and are meeting the sample requirements such as Dubai Police and General Directorate of Residency and Foreigners Affairs however they have decided to not to participate due to certain privacy and approval reasons. The organizations agreed to participate requested to keep the privacy of their identity. Therefore an alias name will be used during the case study chapter calling them organization A, B, C, D, E.

Chapter 5

Case Study

5.1 Introduction

This chapter will present the case studies as part of the research strategy presented in the chapter 5 will include examination of data based on semi-structured interviews where predefined open questions will be defined to give the interview some sort of structure. This will allow to make the interview go in the intended direction and to make the main discussion about the research objectives. The responses to the interview questions will be presented in form of summary presenting interviewee feedback and discussions on the six main questions. This is because the interviews six main questions were used as guidance for topic and were not used in order. Therefore, I will be presenting main points noted in the interview and some insights revealed during the discussions. The aim is to collect as much research related data and insights as possible from targeted organization. In addition, the chapter allows the reader to have a look and get an understanding of the interview discussion that took place before moving to the analysis chapter. This will help to better understand the analysis and retrieved conclusions. I was successful to interview four organizations and the expert also. Due to privacy issues and requests from some of the interviewed organizations, I will be using an alias names (Organization A, B, C, D, E) to hide the organizations identities.

5.2 Interview protocol:

The interview will start by introducing myself and thanking the interviewee to his time. Then, I will explain the main purpose of the study as the three main objectives. The interviewee will be given a copy of the objectives along with the main six questions. During the discussions, I will be presenting some points to the interviewee from my notes such as the critical success factors and other notes in the case study questions below. This will be done to further discuss and to get more insights and viewpoints about the topics being discussed. At the end of the interview, I will thank the interviewee and assure him again regarding the privacy issues and that I will be happy to send him a copy of my research findings if he wants.

5.3 Interview Questions

In the interviews, I will be asking six main standard questions to all interviewees related to my research objectives. These questions will be open questions to get into the issue and there will be other sub questions and notes that I will be using during the discussions to get more insights and cover all needed areas which reflect the semi-structured interview approach. Following are the six main questions with its sub questions and notes:

Case study Questions:

1- Could you explain your role in maintaining effective IT services in this organization?

a. Knowledge about ITG, experience, size of IT Dept, membership of an executive IT/biz committee?

2- To what extent you believe that IT is a vital element in the organization success?

a. Is IT management part of your organization top management committees? IT is on board's agenda??

b. Is part of your organization strategy formation includes the IT strategy?

c. Who takes decision about IT projects/ initiatives? (CIO, Biz, mix)

d. How do you rate the alignment between your organization strategy and IT strategy?

e. Do you assume you have enough resources to support IT strategy?

3- What are the ITG practices in your organization and how effective are they?

a. How IT decisions are being taken?

b. Are roles and responsibilities, and authority clearly defined and allocated?

c. Is ITG part of overall enterprise governance?

d. In your organization, do you use any particular metrics to measure the quality, risk and effectiveness of your IT services? (accountability framework)

e. Are there areas of IT that cause you or your organization specific concern? Examples: disaster recovery, late/over-budget projects, responsiveness to the business demands, cost, ROI, complexity, skill shortages, ability of senior management to stay abreast of issues relating to Information and Communications Technologies, Privacy, other.

f. Do you consider the IT strategy and function support and extends the organization strategy and objectives?

Acceptable IT governance definition should cover: (from literature review)

- *Strategic business IT alignment*
- *Integrated part of CG*
- *Delivery added Value to business through IT*

- *Performance management*
- *Risk management*
- *Policies and procedures*
- *Control and accountability*
- *Authority and Decision making structure*
- *Defined roles responsibilities*

4- In Your organization, which ITG framework/standard/best practice have you used?

- Are you aware of the following ITG practices? (COBIT, ITIL, ISO27001, CMMI, ISO 3800, if other/s, name it please)
- Are you officially certified on one/more of these standards? Does certified means 100% ok??
- Can you describe how do you manage ITG in your organization? Is it internally developed framework or just on ad-hoc basis? Please explain?
- In your organization, do the staff have sufficient expertise in ITG (certification, experience,..)

5- What are the drivers for ITG in your organization?

- a. What are the main drivers/reasons behind it?

From literature review-ITG drivers:

- *Alignment of IT strategy with the organization objectives and overall strategy.*
- *Delivering added value through IT and enable the organization to exploit new opportunities for competitive advantage.*
- *Efficient use and management of IT resources.*
- *Proper management of IT-related risks.*
- *Developing technology policies and architectures.*
- *Proper measurement and control of IT performance.*

- i. have to due to government obligation
- ii. part of internal initiative to enhance IT,
- iii. just to get certified,
- iv. just because other organization took it,
- v. based on a need to enhance IT in the organization (normal drivers and benefits of ITG)
- vi. other reason; please mention
- b. Why specifically this standard selected? Or group of practices?
- i. Any limitations on your selected framework??
- ii. Have you thought of using a combination??

6- In your organization attempts in applying ITG practices or making best use of it, what are the main faced difficulties?/ what allowed/could allow your organization to successfully make it more effective (CSF)?

- a. What made your initiative successful

(from Literature review)IT Governance Principles:

- *Strategic Alignment*
- *Executive management buy-in and continues support*
- *Clear definition and allocation roles & responsibilities (the who)*
- *Policy and Procedure*
- *Communication and transparency*
- *Resource management*
- *Risk Management*
- *Delivery of business added value through IT*
- *Compliance*
- *Ongoing Performance Management*

- *Don't start from scratch*
 - *Integrated within enterprise governance*
 - *IT governance is a continuous life cycle*
 - *Integrated implementation plan is required*
 - *Simple, flexible and scalable*
- b. What difficulties you faced? What could be improved?

All interviewees were given the six main question along with a briefing about my research and the research objectives in few days in advance to give them an overview of my purpose and to give this time if they need to prepare something or even direct me to the right person(refer to Appendix A) .On the other hand, based on the research design I will be attempting to meet two representatives from each organization, one from top or high IT management and second from middle IT management level. This is to allow me getting viewpoints at different levels and see if they match or not. This as part based on the guidelines for case study methods as described in section 4.6 and section 4.7. For some organizations, I was able to meet more than one representative as planned, however for others, although I requested this, I couldn't either them being unavailable and busy or due to time limitations. On the other hand, I will be getting my secondary information from another third party whose expert in ITG and have experience about its practices in Dubai. The selection was to interview a representative from Dubai Financial Audit Department (FAD) and specifically from their IT Audit section. This is because they are considered independent third party who regularly audit the compliance of Dubai government entities IT systems based on COBIT framework. Therefore their input will be valuable to this research as a subject expert and to get some general information from authorized independent third party. During my interviews I have noted the main points and some other insights noticed during the discussion. Few new questions added on case basis because it was valuable at that time of discussion.

5.4 Case Study1: Organization ‘A’

5.4.1 Organization Description

Organization ‘A’ is part of Dubai Government and its activities are mainly for public sector services. They provide services to citizens as well as business and investors. They have a vital role in Dubai Government and are recognized for their quick service across the government. Their IT Department plays a key role in their developed services. Organization ‘A’ IT department is composed of four main units; operations unit, development unit, support unit, and e-services unit. The IT services are used internal for their computerized systems where the all organization ‘A’ processes are 100% computerized. Also they provide services to external customers or business such as property developers, other governmental and semi-governmental departments and to citizens of Dubai. Organization ‘A’ IT department is composed of around twenty employees providing core IT services such as internal computerized systems, online e-services, websites, human resource (HR) development system and help desk services. In addition, they have other services outsourced to external parties such as the HR and finance system from Dubai e-Government known as government resource planning (GRP) which centralized to all Dubai Government entities.

5.4.2 Person interviewed

Successfully I managed to meet and interview the Senior Director of Information Technology Department who is the head of IT in organization ‘A’. He has a vast experience in IT and especially in organization ‘A’ core business where he has been working for organization ‘A’ for more than 6 years.

5.4.3 Response to interview questions

Case study Questions:

1- Could you explain your role in maintaining effective IT services in this organization?

In organization ‘A’ internal processes are 100% e-services or in other words computerized by IT department. The size of IT department is around 20 employee, however we have certain systems outsourced to an external private company which is a company originally established by our IT department in association with another private IT company aiming to export the organization IT enablement experience to the world and turn IT to a source of income rather than a cost centre.

IT governance is important to every organization. Without mapping the IT strategy to business needs IT won’t work properly. There are plans to adopt a formal ITG framework in organization ‘A’ based on the notes and feedback from FAD IT audits and the identified needs. This is planned and documented in IT strategic plan.

IT is member of any new process, organization 'A' has a team called Spot Team which part of the organization operations team. They regularly review the organization processes, improvements and possible new process initiatives. Our membership of this team allowed us to have direct communication with front line and clear details about the processes, issues and current discussions which in turn allowed IT to better serve business by identify what IT can do to make it better and even if it is not possible due to technical impacts and dependencies.

2- To what extent you believe that IT is a vital element in the organization success?

IT is a vital element of our organization and our organization services development and effectiveness is directly related to IT development and success.

IT is part of organization 'A' board committee. Myself, I am member of this board as the head of IT. IT is always on board agenda, as discussed IT is involved in all organization processes therefore the ITG strategy is developed to be mapped directly to the organization strategy. All these strategy details are documented and communicated to all organization staff through the portal.

Decisions are taken by cooperation between both IT and business. After all we have to agree to start a successful project. In our organization we have two way communications. In regard to technical issues IT will have the call in this, however IT understand the new business needs since we are member of the spot transition team and top management team.

Regarding resources there will always a resource issue especially under current financial crisis and government spending control. However, although our team is not that big but we are still doing our best to deliver business needs.

3- What are the ITG practices in your organization and how effective are they?

In our organization, we have clearly defined the roles and responsibilities of every employee including IT staff. For each employee, he has his clear job description, objectives and how it links to department and overall organization objectives. On the other, hand processes are clearly defined and documented by quality team including the decision making process and each one authority.

Regarding if ITG is part of overall enterprise governance, If you mean IT strategy is part of organization overall strategy, then yes and it is totally mapped to align with business strategy. As a function called enterprise governance, a new department was established few months ago and they are carry multiple practices to start their processes and they have been meeting us regularly to see how we do things. I expect they lunch their strategy and clear role in the coming future and for sure IT will be part of it.

Regarding metrics and measurements, In our organization, we use Key Performance Indicators (KPI) and Balance Score Cards (BSC) in every department where performance is monitored and measured using these tools across the organization. In addition at service level we utilize certain ITIL processes to help us in streamlining our service.

4- In Your organization, which ITG framework/standard/best practice have you used?

In our organization we are using ITIL for service IT and process management and also aware of COBIT because of being audited against COBIT by FAD.

Actually we are not certified, but in my opinion you don't have to be certified to be effective. Also, as mentioned we are using selected ITIL and COBIT feedback and recommendation from FAD.

- Can you describe how do you manage ITG in your organization? Is it internally developed framework or just on ad-hoc basis? Please explain?

Overall, we don't have a formal framework for ITG, however as explained earlier IT is managed as part of the overall organization management system. From strategy point of view we build and our IT strategy that is mapped to the organization strategy. We have direct access to top management and head of IT is directly reporting to the head of the organization. In addition IT representatives are members of committees from highest level (organization board) to mid level (projects team) and operational (spot team). In terms of measurement and control we use the organization measurement tools such as KPI and BSC. In terms of standards we use ITIL and partially COBIT.

Here is asked the question, do you believing having a formal documented ITG framework will be useful to keep you IT department success and effectiveness??

The answer was yes, we should do this and we already got this note from FAD audit.

Another question was, do you have an IT and IT security policy document?

The answer was not really as a total document to be referred to. Certain things are documented as a process and change process but not as a policy. Having this will be useful and we already have this document in our IT strategy plan.

Regarding qualified certified staff; having qualified expertise is key. In terms of ITG certification we have some staff went through ITIL training in addition to ITGAF ITG trainings and workshops.

5- What are the drivers for ITG in your organization?

The main driver for ITG in our organization is Management support and push toward effectiveness in IT. Also, FAD audits and ITGAF awareness programs urge us to do more toward ITG.

Also, the benefits of these frameworks in helping to streamline processes and formalize practices.

6- In your organization attempts in applying ITG practices or making best use of it, what are the main faced difficulties?/ what allowed/could allow your organization to successfully make it more effective (CSF)?

The main CSF are:

- management ongoing support

IT is member of top management board, Management believe and understand the important role of IT and enabling the business and enhancing the services.

- Talented resources

We have relatively a small team; however they are technically qualified and very good communicators. This is very important because it allows them better understand the business needs and issues. Thereby our response will be effective.

- Clear Strategy

Our organization strategy is very clear and IT is part in building this strategy and we play a vital role in communicating it to the rest of the staff through our portal.

- The availability of measurements using KPI for IT projects and services which allows better control for services and projects and progress.

- Clear and documented processes from top level to the lowest level

This allowed IT to properly understand all business the processes and the relationship between them and accordingly better design and improve new IT services to support them.

- Clear communications

The whole organization works as one team. We are all close to each other; we have really open door policy even to the head of the organization. Therefore things move smoothly, issues resolved faster and ideas communicated and accepted easily. Saying if you need something from someone you just go to him, you don't need to send an email!! He also said we can go to the head of the organization if you want!!

From my observations, the communication was very true; later on they introduced me to the head of the organization and also to the head of corporate governance.

Difficulties: mainly the opposite, findings qualified resources is key and retaining becoming harder due to budget issues. Also, due to financial crisis, budget is a key issue where had to freeze many projects and plans. However, we are doing our best to be effective and efficient with the same developing quality if service.

Also, conflicts between organization 'A' systems and other enforced IT systems and services from higher authorities were these systems are being enforced on them without matching their real environment and needs. This is due to lack of communication and participation of both parties in regard to such systems development and implementations.

Other general observations and insights I noticed from discussions: I have noticed fair knowledge about ITG frameworks and practices in the interview, there are no written IT policy or ITSEC policy.

5.5 case study2: Organization ‘B’

5.5.1 Organization Description

Organization ‘B’ is considered one of the first departments in Dubai government their core services are public service. Their customers are mainly Dubai citizens along with business customers. Organization ‘B’ IT department is composed of five main units; support unit, System Development unit, IT Security unit, Infrastructure unit, e-transformation/portfolio unit, PMO unit. They provide many services and solutions across all organization ‘B’ departments and functions reaching around 70+ systems. In addition, they provide around 500 e-services. E-services are divided into business to business 80% and consumers/civilians 20% .Most e-services are to business partners such as consultants, developers, other government entities, and semi government entities.

5.5.2 Person interviewed

In organization ‘B’ interview was conducted as group meeting as per the organization request. The meeting included three interviewees; the Assistant Director of IT Department, the Application Design & Development Unit Head, and the IT Security Unit Head. This group interview allowed having different viewpoints in one meeting further discussions and clarification from interviewees representing different units at different organizational levels.

5.5.3 Response to interview questions

Case study Questions:

1- Could you explain your role in maintaining effective IT services in this organization?

The Assistant Director of IT Department explained this that the IT department makes sure to maintain effective IT services in the organization by utilizing latest technologies that meets business needs. To do this they have adapted certain best practices and standards in the field of IT management and ITG such as ITIL v2 or ISO 20000 by service desk team, PMI by PMO team, ISO 27001 by IT security team and ISO 90001 for quality assurance. The IT department provides over 70 IT systems and around 500 e-services internally and for normal and business customers.

The Application Design & Development Unit Head and the IT Security Unit Head added that they make sure to identify the right needs and that IT delivery is measured through KPI.

2- To what extent you believe that IT is a vital element in the organization success?

In organization 'B' IT is not directly reporting to the CEO, they fall under service sector. The head of IT reports to the head of service sector who's a member of the organization top management board committee.

In regard to IT on boards agenda, the Assistant Director of IT Department explained that if needed it will be there. However if mean from strategic point of view, IT strategy is mapped to the organization strategy and built on organization objective in associate with all other departments.

Decisions are taken using a mixed approach between IT and business. IT raises a business case detailing the needs and benefits and recommendations. Then business review and after that if both agree the project goes forward.

Based on FAD audit we have been given 2.76 based on COBIT scale

When building the IT strategy, it is built for three years similar to the organization strategy. The process takes place by conducting workshops where each department formulate its own strategy and needs from other departments if needed. Then combined workshops conducted between departments to resolve dependencies and apply changes if needed. All this happens in line with the organization overall policy.

Resources are an issue especially after the financial crises, however we are doing our best to adapt and satisfy our business needs.

3- What are the ITG practices in your organization and how effective are they?

Regarding if ITG part of overall enterprise governance, on our organization the quality and excellence department make sure this happen. They monitor all departments processes and governance frameworks and assure it is aligned with the organization overall objectives and direction.

For control metrics and measurement, we use KPI as measure for service levels and project delivery for all departments.

However, for each department in IT they follow their employed framework (ITSEC use ISO27001, service desk uses ITIL, ..)

In IT, we make sure our strategy and services are aligned with the organization and we always look to how to extend it further. Last year we won the best IT department in Dubai 2009.

4- In Your organization, which ITG framework/standard/best practice have you used?

In our organization we have ITIL v2 known as ISO 20000 used by service desk team, Project management Institute (PMI) framework used by PMO team, ISO 27001 is used by IT security team and ISO 90001 is used for quality assurance. Also, we deal with COBIT since we are being audited against COBIT by FAD.

Actually we are not certified with these standards yet. It is in the process for but certified doesn't mean effective it is just an indication. For any framework you have to customize your selection to your needs otherwise it might not work for you.

In general as discussed, we manage our ITG using a combination of standards, each in its area of power. We make sure to customize to meet our environment and needs.

A question from discussions was, how do you make sure to avoid conflicts between all these frameworks?? Does they work in silos?

The response was this was an already identified issue and they make sure this doesn't happen by making sure no overlapping happens between these standards and that all these teams/units work together. Also the fact the excellence department monitor all such activates and document impacted processes. Furthermore the change management and control system which considered the link and enforcement point for all changes in IT and part of organization 'B' IT change management approval process is to assure no overlapping happens. As per the Application Design & Development Unit Head, this allowed to integrate the vertical soils into horizontal integration from across focusing on service level.

We have staffs who are certified ITIL and PMP. Others have sufficient knowledge about the concerned area based on the training and workshops we send them to.

5- What are the drivers for ITG in your organization?

One of the main drivers is Dubai excellence award were we won the best IT department last year and tend to keep this high position.

Also, the push from management and specifically the excellence and quality department they make always make sure that all organizations services and projects are aligned with the organization overall strategy.

One more driver is the benefits these frameworks and best practices give. They help in developing our service up to the industry best practice and it provides solution for certain problem areas we face.

6- In your organization attempts in applying ITG practices or making best use of it, what are the main faced difficulties?/ what allowed/could allow your organization to successfully make it more effective (CSF)?

CSF:

- Top management support
- It's a culture change process: especially in our organization, any new change might face difficulties accepting it. Therefore, we make sure to do awareness sessions, trainings, and meetings to pass these changes in the most suitable methods. After all it's a culture change process we do here.
- Competent Resources
- budget
- knowledge transfer through awareness
- The presence of measurements and controls (KPI, excellence award, quality dept, ..), showing the results especially the big wins, simplifying things (not complicate the work)

Difficulties: the opposite,

- No direct access to top management for IT.
- The organization culture and willingness to new changes. It's a lengthy process.

From my observations I noticed that there is a little confusion in IT Department due to the employment of all these standards at the same time!! This might be due to the lack of awareness or proper planning for such project, or just not knowing or seeing the real benefits and feasibility of these initiatives.

5.6 Case Study3: Organization ‘C’

5.6.1 Organization Description

Organization ‘C’ provides services to the public in Dubai. For them information privacy is key due to the nature of their job. In addition, they always seek to provide faster effective services to the public. Their customers are the public in Dubai and certain type of businesses and individuals who deals directly with them. They were used to provide services on site through customer service hall, however since two years they started to provide e-services which reduced the load on the customer service hall by 40% and allowed the customers to track and finish the request much faster and easier.

5.6.2 Person interviewed

The interview was with the head of IT department. He has a wide experience in IT. He joined the organization since two years and since then organization ‘C’ witnessed huge development and enhancements for IT role in the organization. He has very good IT technical and management knowledge. Also, he is reporting directly to the head of the organization.

5.6.3 Response to interview questions

Case study Questions:

1- Could you explain your role in maintaining effective IT services in this organization?

The IT department is composed of around 20 employees; however we deliver many services and manage multiple systems and enhancements that made the 20 employees work as 40 in terms of output.

The head of IT reports directly to the head of the organization. Also, we have an IT steering committee which is composed of the head of IT along with departments head. I consider this committee a major element in developing our IT services and allowed more communication between IT and business. The IT committee was very effective in achieving ITG effectiveness and improvement. Also we have an IT representative as a member of suggestions system board which gave us access to staff feedback and suggestion to improve our services. We are also part of the customer service committee to track customer needs and feedback on our services.

2- To what extent you believe that IT is a vital element in the organization success?

Few parts are covered in the first question.

Regarding IT on boards agenda, yes as part of organization 'C' strategy IT is one of the key points in the strategy. We have an IT strategy that is mapped to the organization strategy. This helped better prioritize our projects and better support the business.

We have a clear IT strategy which is linked to the organization strategy. The organization strategy development process involves all departments together to set the high level strategy and then each dept develop its strategy based on that, however all these are reviewed by each department. The quality section make sure to map, assign ownership and responsibilities, agree on tasks, timeline, KPI's and measurement process.

Regarding decision taking, it is a shared process between IT and business. Business case is raised, discussed reviewed by quality and excellence team. Our quality & excellence team plays a vital role in our organization and especially on IT department success. They are with us whenever we want to analyze a situation to provide or improve a service. They understand all the services in the organization and they have fully documented and mapped to each other. This allowed us to better understand the business structure, processes and needs. And in return, allowing us to better design our services and initiatives.

Regarding resources, In IT we have all the support from top management which allowed us to deliver more than expected based on our number.

3- What are the ITG practices in your organization and how effective are they?

As discussed earlier we are part of top management committee and we have IT presence in all levels from top to operations and customer service committees.

We are utilizing ITIL for service and process management, ISO90001 for quality and going toward ISO27001 for IT security. COBIT is from FAD and we got 1.4 keeping in mind it was 1.0 last year.

Regarding control and measurement, we use KPI across the organization including IT. It is very effective to set targets, show the progress and track the project delivery. In addition, we have FAD IT audit, on annual basis they audit our IT based on COBIT and the feedback is considered as a type of external independent measurement for us.

In addition, one of the measurements is customer satisfaction where every 2 month there is a survey and feedback is studied and reflected on Department services and overall plans.

4- In Your organization, which ITG framework/standard/best practice have you used?

We are utilizing ITIL for service and process management, ISO90001 for quality and going toward ISO27001 for IT security. COBIT is from FAD and we got 1.4 keeping in mind it was 1.0 last year.

We are not officially certified except for the quality part through the quality department, but being certified doesn't necessarily means effective. However it is good to be certified, it will act as a prove for your efforts.

- Can you describe how do you manage ITG in your organization? Is it internally developed framework or just on ad-hoc basis? Please explain?

As described earlier we look at several best practices and use applicable sections. For example, we use certain parts of ITIL to help in developing our service and support function. Also, we implemented a change management process to control and manage the impact of any changes in the system. The committees we have in place that allowed IT high presence from top management to operational level. in addition, we have developed the IT and IT security policies and processes for all our tasks.

Also, FAD COBIT audit reports helped us to identify the gaps and needed improvements. More awareness from FAD is needed, on how to solve the issues and where to look for more information could help a lot.

We consider all these as part of ITG practices.

- In your organization, do the staff have sufficient expertise in ITG (certification, experience,..)

For me, I am really interested in this topic and have plans to utilize best practices from all aspects in my organization. It takes time due to many changes happening right now. The staff has some general knowledge and awareness programs are taking place.

5- What are the drivers for ITG in your organization?

The main drivers are Dubai excellence award, aim to improvement and enhancement, to get a since of measurement, the flexibility of management. One other key thing is management and staff willingness to change in our organization.

6- In your organization attempts in applying ITG practices or making best use of it, what are the main faced difficulties?/ what allowed/could allow your organization to successfully make it more effective (CSF)?

CSF:

- Clear communication and one team spirit
- Management and team willingness to change
- Top management ongoing support and follow-up

- Direct connection and work with quality team “assisted in proper processes identification and design”
- IT analyst accompanied with Quality team was considered one of the key success factors by IT head. This is because quality had defined, documented and fully understand all organization processes where this helped IT to better understand the needs and how to design services accordingly. This close link with quality was considered key for IT.
- The high involvement of IT (committees)
- The use of knowledge resources and expertise (Gartner).
- Conducting IT awareness to Department heads to show what IT can do for them and how we can help them.
- The clear IT strategy which is linked to the Organization strategy

Difficulties:

- Change takes time to apply due to the culture
- However this is going in the right direction after the awareness sessions conducted by IT and the clear communication and coordination with different departments.
- Budget, resources
 - Conflicts and enforcement
- Conflicts with other departments and the system that are being enforced on organization ‘C’ by higher authority. This system doesn’t match our needs and whenever changes needed it takes so long time to apply. More communication and transparency is needed to improve this.

5.7 Case Study4: Organization ‘D’

5.7.1 Organization Description

Organization ‘D’ is considered one of the fastest growing entities of Dubai Government. They provide and manage several vital infrastructure services in Dubai. They are composed of a group of agencies working in different infrastructure services. Their customers are all citizens of Dubai.

Organization ‘D’ IT Department is considered one of the best IT departments in Dubai and recently received an award for their innovative efforts and accomplishments in IT. They provide around 164 e-services and have received more than ten local and international awards for their innovative e-services. Their services are categorized as world class services taking into account top international best practices for providing service that even consider customer with special needs in their service design and delivery. Their IT department is composed of around 50 employees along with 70+ outsourced staff. Since they have multiple agencies they have approached a different IT organization structure. Central core IT services are under the IT department sections and for each agency there is a dedicated team that is lead by a manager directly reporting to the CIO. This manager role is representing the business, communicating its needs and managing all aspects of IT services in this agency.

5.7.2 Person interviewed

An IT manager of one of the agencies. He has been with the organization for more than four years. He has wide knowledge in IT and an expert IT project management.

5.7.3 Response to interview questions

Case study Questions:

1- Could you explain your role in maintaining effective IT services in this organization?

Response detailed in the introduction of Dubai Land.

I am IT manager of one of the agencies. I have been with the organization for more than four years. My role is representing the business, communicating its needs and managing all aspects of IT services in this agency. I am considered the focal point of contact and the link between business (the agency) and the corporate IT department. I make sure the provided services are as per agreed SAL and that the agency projects are moving in the right direction. I report directly to the head of IT and also to the head of agency.

In addition we have a department called IT Governance and Project Management Department. They make sure to map all processes to the deployed best practices and assure efficiency and effectiveness across all IT projects and services from all aspects.

2- To what extent you believe that IT is a vital element in the organization success?

In our organization, IT has a vital role due to the fact that most of our services and operations fully depend on IT technologies. This is clear were the chief Information officer (CIO) or the head of IT is a member of organization 'D' top management board. IT has contributed a lot to the organization success and enablement. Our projects introduced multiple initiatives that saved more than 2 billion AED on the government in 2009 through process automation and e-services.

In IT we have multiple working groups and committees at all levels. We have the monthly IT board meeting where the CIO meets all the agencies directors along with the agencies IT managers. They review the provided services and progress of projects and discuss any issues to solve it on the spot in presence of business and IT. Also we have the IT steering committee monthly meeting that includes all the CIO, all IT sections heads and the agencies IT Managers. This committee concentrates on projects progress services levels and all technical issues.

3- What are the ITG practices in your organization and how effective are they ?

In general, what were discussed in questions 1 and 2 is part of it. Also, we have other teams at IT department level such as Core Architecture Review Team (CART) where they make sure to review all processes and remove redundancies and set the standards for all technical and management requirements. Also we have the Change Advisory Board (CAB) who are responsible for reviewing and approving changes in the IT infrastructure.

All processes are documented and computerized. Responsibilities are clearly defined and staff efforts are monitored and evaluated through the system. We use a work flow system that whenever someone is assigned a task, depending on the tasks and other predefined factors, he will be given a certain SLA to resolve and accomplish this task. Otherwise he will be reminded automatically.

4- In Your organization, which ITG framework/standard/best practice have you used?

We use ITIL for service and process levels, PMI framework for project management and ISO 27001 and aeCERT (UAE Computer Emergency Response Team) agreement for IT security. For

ITG in general we utilize COBIT governance framework which was customized to our needs and environment.

5- What are the drivers for ITG in your organization?

One of the main drivers is Dubai excellence award. Also, to comply with FAD IT audits. In addition, to achieve maximum efficiency we have used ITIL and it was effective.

Being certified is good but it doesn't necessarily mean you have effective ITG practices.

6- In your organization attempts in applying ITG practices or making best use of it, what are the main faced difficulties?/ what allowed/could allow your organization to successfully make it more effective (CSF)?

CSF:

- Top management support
- The use of mature ITG frameworks and customize it to our needs and environment.
- Going toward standards step-by-step which allowed achieving more acceptance and effective culture change.
- The use of standards, best practices and frameworks on need basis. Meaning we don't look at using certain framework for sake of having it only.
- Qualified staff
- Communication and one team spirit

Our IT team all knows each other and this allows things to move smoothly without any politics. We have a team called Fun Team; this is a team composed of three members from IT and it changes every month. Their task is to arrange team activities every month. This monthly team activity is participated by all IT department staff including the CIO himself and even the vendors and outsourced staff.

Difficulties:

- Increasing Requirements
- Ad-hoc requirements or unplanned requirements which impact our planned projects and consume our resources.
- Certain project alignment with IT strategy where they are kind of separate.
- Certain systems not matching our requirements that are enforced by higher authorities and we have to use it. We need more transparency and communication to modify it to our specific needs.

5.8 Case Study 5: organization ‘E’

5.8.1 Organization Description

Organization ‘E’ is one of the largest organizations in Dubai. They deal with special types of customers mainly business customers. Their IT department provides many IT services in vast different areas due to the nature of business. Most of their services are e-services and their IT department has a unique structure which is different than other IT departments in Dubai government. They have a department named Enterprise Architecture which supervise and managed the IT strategy, the technology architecture and the business architecture all together. They are considered the process engineers and enforcement point to apply the agreed on policies and procedures. They make sure to avoid duplications and conflicts between which allows more efficiency in the organization. In addition the enterprise architecture (EA) team monitors and control deployed standards and best practices implemented across the organization to make sure no conflicts and avoid silos processes.

5.8.2 Person interviewed

I managed to interview the head of EA department. He has wide experience in the field of information technology in organization ‘E’.

5.8.3 Response to interview questions

Case study Questions:

1- Could you explain your role in maintaining effective IT services in this organization?

I am the head of EA in organization ‘E’. We are responsible for the IT strategy, technology architecture and business architecture. We make sure to understand all process across all business sectors and review them in a process called processes decomposition where we review and analyze each process in details from all perspectives. After that, we identify the business requirements and do the gap analysis. Then we review the all existing standards processes to identify each one strength and weakness in relation to our processes. After that, roles and responsibilities assigned and EA compliance recommendation communicated.

2- To what extent you believe that IT is a vital element in the organization success?

EA reports directly to the head of organization. EA head id member of executive board committee. Also representatives from EA are members of other committees such as IT committee and business committee and change board. They is important so we can continue of details view of current processes and enforce the agreed on policies and architectural specifications in business and IT processes.

3- What are the ITG practices in your organization and how effective are they?

Some parts already discussed in questions 1 and 2. In addition since the deployment of EA and after carrying the process decomposition project we managed to save around 70 million AED from duplicated and un-realistic processes.

4- In Your organization, which ITG framework/standard/best practice have you used?

In general, we use COBIT framework as the high level framework and then map it to all other standards in place such as ITIL, ISO27002 (Information Security Standard), ISO 9001:2008 (Quality Management Standard) and BS25999 (British Standard - Business Continuity Management - BCM), and ISO 10002:2004 (Certificate for Customer Satisfaction Complaints). In addition we use The Open Group Architecture Framework (TOGAF) which is a framework for enterprise architecture that provides a complete approach to the design, plan, implement, and governance of enterprise information architecture. Also the Zachman enterprise architecture framework is being used as part of our customized enterprise architecture approach.

5- What are the drivers for ITG in your organization?

Improving efficiency and enhancing effectiveness. Also to after each department had used its own framework such as ITIL, ISO27001, ISO9001 and so on; we identified the need to map them together especially after noticing that each department started working by itself in silos from other departments frameworks. This integration was vital to make best use of these frameworks and standards.

6- In your organization attempts in applying ITG practices or making best use of it, what are the main faced difficulties?/ what allowed/could allow your organization to successfully make it more effective (CSF)?

CSF:

- Having clear documented and detailed process for all the organization.

This was done based on the process decomposition project which allowed such function (EA) to start and deliver.

- The location of EA in the organization structure
Being directly reporting to the head and responsible for IT strategy, technology architecture and business architecture; allowed EA to be more effective and enabled EA to enforce its policies and compliance rules.

- EA presence at all levels which allowed communication and access to all business units.

Difficulties:

- The change process is lengthy and sometimes difficult due to certain higher policies
- The culture is not that much willing to change.

In other words everyone is happy with his framework and processes and don't want someone to tell them you are wrong.

5.9 Independent Expert interview

5.9.1 Person interviewed

This interview was conducted to have a third party independent ITG expert view on ITG practices in Dubai. The selection was on head of IT audit from FAD, Dr. Yahya Ahmed Al Sharji. They regularly conduct IT audits on Dubai Government organization to ensure compliance with IT best practices. This role allow them to have a better view on current ITG practices due to their expertise and the sort of full access they could have to all Dubai Government Organizations which I couldn't have.

IT audit started in 2000 however it was less focus with less structure. Currently it is more structured were COBIT framework is used. In addition to their IT audit tasks, they take the role to promote ITG practices and conduct regular awareness to Dubai government organizations. The awareness part is delivered through Information Technology Governance Assurance Forum (ITGAF) initiative. ITGAF is a forum focusing on promoting the awareness of ITG practices in Dubai. They also recognize and reward the best successful ITG practices on annual basis.

For this interview I have prepared a different list of questions where the objective was to get an expert view regarding my research objectives. Also, to get insights since they are conducting detailed evident proven IT audit.

4.9.2 Response to interview questions

The questions:

1- Could you explain your/FAD role in promoting and maintaining effective ITG DG entities?

FAD IT audit department role in promoting and ensuring IT compliance is based on a mandate by Dubai Government law number 3, 2007 which states to audit financial, Information system and business as part of FAD role.FAD employed COBIT framework due to its features as a genuine resource and the international recognition of COBIT framework.

Auditees don't have to use COBIT in their organizations where FAD doesn't enforce it. However, they audit against COBIT to convince and provide a since of credibility and acceptable structure to their IT audits.

On the other hand, we promote ITG practices through our ITGAF initiative where we conduct trainings, workshops and reward the most successful organizations in our annual ITGAF gathering conference.

2- Can you discuss the degree, to which the concept of IT governance is recognized, formalized, established and accepted within Dubai Government (DG) organizations "Awareness".

The average rating for Dubai Government organizations is between low to medium (1.8 to 2.0 on COBIT scale) which based on COBIT between 'Initial/Ad Hoc' and 'Repeatable but intuitive'. However certain organizations got higher ratings such as RTA, DUBAL and Dubai Municipality.

3- What is the level of IT governance expertise in Dubai government entities.

The level of ITG awareness in Dubai Government organizations from knowledge wise from 20-40%, however in organization with higher rating they have specialized qualified expertise which demonstrate their better scores.

4- Based on your experience/audits ,which IT governance frameworks/standards/best practices (COBIT, ISO27001, ITIL, ...) are being (or going to be) used in DG entities? Anyone Certified? "Current Practices"

FAD IT audit areas of focus are on two main areas:

1. ITG: IT process maturity, IT policies, processes, procedures and IT strategies
2. Management: IT infrastructure and Applications full life cycle

FAD considers ITG as part of overall CG. This allows higher support for IT and management to better understand and appreciate IT role thereby allowing IT to better enable business.

DG organizations are competing mainly on the following ITG practices: ITIL, COBIT, ISO27001, CMMI, and combinations. Some are certified also.

5- How does adoption of formal IT governance practices (standards like COBIT, ...) lead to improved alignment between IT and business? "Effectiveness"

In an answer to the question, does the adoption of certain formal ITG practices lead to improved IT/biz alignment?? The answer was that alignment by itself is a component of ITG where it focuses in IT/business alignment. Also that business drives IT to alignment.

6- Based on your experience/audits, does certified means effective?

Yes and no, because based on my observations and audit experience, most of certified government organizations tend to have effective ITG. However it's not a must. Being certified is a good indication because they will have at least the minimal which can be the start toward full utilization of these frameworks.

7- To what extent you believe that having effective ITG practices is a vital element in the organization success?

Very true, IT is vital to every organization and our roles to make sure this happens and promote the best utilization of IT. One key thing is that IT steering committee at different levels is needed; it will solve the gap between IT and business.

8- What are the drivers for deploying ITG in DG entities?

The main drivers for ITG in DG are:

Internal: the interest of top management and awareness/full understanding of its role and benefits.

External: exposure to outside, accountability, (FAD role is to ensure compliance however enforcement should be taken by another party “e-gov” to ensure FAD independence as a supreme audit institution for DG)

9- What is the maturity rate of IT Governance in Dubai government entities? “Maturity”

The rating for DG organizations is between low to medium (1.8 to 2.0 on COBIT scale) which based on COBIT between ‘Initial/Ad Hoc’ and ‘Repeatable but intuitive’. However, certain organizations got higher ratings such as RTA, DUBAL and Dubai Municipality.

10- In DG organization attempts to apply effective ITG practices or making best use of it, what are the main faced difficulties? What allowed/could allow DG organizations to successfully make it more effective (CSF)?

CSF: Top management support and awareness of ITG and the availability of ITG qualified staff.

Difficulties: lack of understanding and knowledge, lack of resources and guidance.

11- Does FAD have their own model for IT governance maturity and effectiveness? Or COBIT is considered the only model in use? is one framework enough?

FAD only uses COBIT in their audit methodology and they consider it as enough because it is general and serve audit objectives.

Chapter 6

Data Analysis

6.1 Introduction

In this chapter I will be discussing and analyzing data collected from the conducted case study interviews. In addition I will be presetting the results from this analysis. As per the research strategy, I will be aiming to answer the research questions and meet the research objectives identified earlier in the research methodology chapter.

Since my research depends on qualitative data the data analysis will be following qualitative data analysis approach discussed in sections 4.6 & 4.7. Qualitative data analysis starts with readying and describing the data. Then, classifying the data into categories based on similarities, differences, common themes. Categorization can depend on many factors and situations; it is all based on the researcher and how he can carry the abstraction process. Abstraction is defined as a mean to greater clarity and precession in making comparisons. However, it has certain limitations, when conducting comparisons, it is important to distinguish between two kinds of relation. There is the substantial relation of connections and interactions and there are the formal relations of similarities and differences between object and events (Dey, 1993). After defining the categories and placing the data in its category, the third step is to connect data by finding relations within and between categories.

Based on the presented data in chapter 5 and the research objectives, following are the categories I assume will best help in identifying the relations that will help achieving the research objectivities.

- a. Current ITG practices.
- b. The extent to which the concept of ITG is recognized, formalized, established and accepted
- c. Main drivers behind adopting certain ITG practices.
- d. The Critical Success Factors for effective ITG practices
- e. Difficulties facing effective ITG practices

I have selected above five categorize after revisiting the research objectives. Using categories that are based on the research objectives will assure to stay focused on the research aims and the same applies discussion and analysis. I will be looking at each organization from these categories perspective and summarize the main points into below tables. This will allow easier comparison to find out connection and relation within and between identified categories.

6.2 Data Analysis Comparison Schedule

Following tables will be used as the basis for discussions. It list comparison based on the identified five data categories and the findings from each organization.

Table 6.1 - Data Analysis – category ‘a’

Organization	a. Current ITG practices
Organization A	<p>There are ITG practices where they have IT committees at different levels in the organization allowing high presence for IT.</p> <p>The IT strategy is there and mapped to organization strategy.</p> <p>Roles and responsibilities are defined</p> <p>Head of IT directly reporting to the head of organization</p> <p>They use parts ITIL and aware of COBIT and they consider them useful.</p> <p>Also they use KPI and BSC for performance measurement.</p> <p>Current practices are considered effective in meeting the business needs however there is a concern that this might be a one man show. It needs to be formalized more to assure sustainability of effective ITG practice.</p>
Organization B	<p>They have many formal ITG practices such as ITIL v.2/ISO20000, ISO27001, PMI, COBIT, ISO90001 and KPI.</p> <p>They have been rated as 2.76 based on COBIT scale by FAD audit which similar to the industries standard rating.</p> <p>They have steering committees however it was noticed that these are not well organized to cover all aspects of ITG. The examples I was given the ISO27001 committees and new projects teams.</p> <p>Their challenge is rolling out the acceptance and avoiding silos in ITG initiatives.</p>

Organization C	<p>They are using certain practices such as ITIL and aware of COBIT based on FAD audits. Also they use KPI for performance measurement and ISO90001 for quality.</p> <p>Head of IT is member of organization top management committee and IT has high presence due to the committees they are part of. This gave them better view on the business needs.</p>
Organization D	<p>They have committee at all levels that seems to be doing great job</p> <p>They multiple local and international awards in IT</p> <p>They have EA function that is well established</p> <p>They use ITIL, COBIT, PMI, and ISO27001</p>
Organization E	<p>COBIT as overall governance IT framework</p> <p>ITIL, ISO27001, ISO 9001, BS25999, ISO 10002, PMI, KPI and DSC</p> <p>In addition to TOGAF and Zachman for EA</p>

Table 6.2 - Data Analysis - category 'b'

Organization	b. The extent to which the concept of ITG is recognized, formalized, established and accepted
Organization A	<p>In general, the concept of ITG is recognized, fully acceptable and in the way to formal establishment because it is partially formalized. There are in progress plans based on the head of IT and head of the new CG unit whom I met also.</p>
Organization B	<p>Referring to above info, they are using a combination of well know mature ITG practices which helped them to streamline many processes.</p> <p>In general ITG concept is well recognized, formalized, established</p>

	<p>and accepted.</p> <p>The concern was that they started all these initiative together which might cause acceptance issues. However they responded that they are dealing with this be awareness programs and further communication.</p> <p>Another concern was that each standard is handled by a different department (PMI by PMO, ISO27001 by ITSEC,..) this might lead to working silos in ITG practices which might result in conflicts and redundant processes limiting the effectiveness of ITG. The response was they identified this and worked on integrating these practices horizontally to be enforced through change management process.</p>
Organization C	<p>Currently they are in a transition phase for the IT function and there is an awareness in the IT management about ITG practices and its benefits</p> <p>Current practices are effective to some extent, however it needs to be formalized which needs time in this organization case.</p> <p>In general ITG concept is recognized, accepted, partially formalized and not yet established. However, based on their plans they are going in the right direction.</p>
Organization D	<p>In general ITG concept is well recognized, formalized, established and well accepted and practiced in the organization.</p>
Organization E	<p>In general the concept of ITG is well recognized, formalized, established and accepted.</p>

Table 6.3 - Data Analysis - category 'b'

Organization	c. Main drivers behind adopting certain ITG practices
Organization A	<ul style="list-style-type: none"> - Management support and push toward enabling IT role. - Dubai excellence award - FAD compliance ITG audits - The benefits they can gain from ITG practices
Organization B	<ul style="list-style-type: none"> - Dubai excellence award (they won it once) - Push from management and specifically the excellence and quality department - The benefits these frameworks and best practices provide in addressing ITG issues
Organization C	<ul style="list-style-type: none"> - Dubai excellence award - aim to improvement and enhancement - to get a sense of measurement - the flexibility of management - management and staff willingness to change
Organization D	<ul style="list-style-type: none"> - Dubai excellence award - comply with FAD IT audits - to achieve maximum efficiency and effectiveness (EA)
Organization E	<ul style="list-style-type: none"> - Improving efficiency and enhancing effectiveness - To integrate all existing ITG practices and make best use of them to avoid silos.

Table 6.4 - Data Analysis - category 'd'

Organization	d. The Critical Success Factors for effective ITG practices
Organization A	<ul style="list-style-type: none"> - management ongoing support - Talented resources - Clear Strategy - The availability of measurements using KPI and BSC - Clear and documented processes from top level to the lowest level - Clear communications
Organization B	<ul style="list-style-type: none"> - Top management support - It's a culture change process: especially in our organization, any new change might face difficulties accepting it. Therefore, we make sure to do awareness sessions, trainings, and meetings to pass these changes in the most suitable methods. After all it's a culture change process we do here. - Competent Resources - budget - knowledge transfer through awareness - The presence of measurements and controls (KPI, excellence award, quality dept, ..), - showing the results especially the big wins - simplifying things (not complicate the work)
Organization C	<ul style="list-style-type: none"> - Clear communication and one team spirit - Management and team willingness to change - Top management ongoing support and follow-up - Direct connection and work with quality team "assisted in proper processes identification and design" - IT analyst accompanied with Quality team was considered one of the key success factors by IT head. This is because quality had defined, documented and fully understand all organization processes where this helped IT to better understand the needs and how to design services accordingly. This close link with quality was considered key for IT. - The high involvement of IT (committees) - The use of knowledge resources and expertise (Gartner). - Conducting IT awareness to Department heads to show what IT can do for them and how we can help them. - The clear IT strategy which is linked to the Organization strategy

Organization D	<ul style="list-style-type: none"> - Top management support - The use of mature ITG frameworks and customize it to our needs and environment. - Going toward standards step-by-step which allowed achieving more acceptance and effective culture change. - The use of standards, best practices and frameworks on need basis. Meaning we don't look at using certain framework for sake of having it only. - Qualified staff - Communication and one team spirit <p>Our IT team all knows each other and this allows things to move smoothly without any politics. We have a team called Fun Team; this is a team composed of three members from IT and it changes every month. Their task is to arrange team activities every month. This monthly team activity is participated by all IT department staff including the CIO himself and even the vendors and outsourced staff.</p>
Organization E	<ul style="list-style-type: none"> - Having clear documented and detailed process for all the organization. <p>This was done based on the process decomposition project which allowed such function (EA) to start and deliver.</p> <ul style="list-style-type: none"> - The location of EA in the organization structure Being directly reporting to the head and responsible for IT strategy, technology architecture and business architecture; allowed EA to be more effective and enabled EA to enforce its policies and compliance rules. - EA presence at all levels which allowed communication and access to all business units

Table 6.5 - Data Analysis - category 'd'

Organization	e. Difficulties facing effective ITG practices
Organization A	<ul style="list-style-type: none"> - mainly the opposite - findings qualified resources - due to financial crisis, budget <p>conflicts between organization 'A' systems and other enforced IT systems</p>
Organization B	<ul style="list-style-type: none"> - Mainly the opposite - No direct access to top management for IT. - The organization culture and willingness to new changes. It's a lengthy process
Organization C	<ul style="list-style-type: none"> - Change takes time to apply due to the culture <p>However this is going in the right direction after the awareness sessions conducted by IT and the clear communication and coordination with different departments.</p> <ul style="list-style-type: none"> - Budget, resources - Conflicts and enforcement <p>Conflicts with other departments and the system that are being enforced on organization 'C' by higher authority. This system doesn't match our needs and whenever changes needed it takes so long time to apply. More communication and transparency is needed to improve this</p>
Organization D	<ul style="list-style-type: none"> - Increasing Requirements - Ad-hoc requirements or unplanned requirements which impact our planned projects and consume our resources. - Certain project alignment with IT strategy where they are kind of separate. - Certain systems not matching our requirements that are enforced by higher authorities and we have to use it. We need more transparency and communication to modify it to our specific needs.
Organization E	<ul style="list-style-type: none"> - The change process is lengthy and sometimes difficult due to certain higher policies - The culture is not that much willing to change. <p>In other words everyone is happy with his framework and processes and don't want someone to tell them you are wrong</p>

Table 6.6 - Data Analysis – Expert Interview

Item	Expert interview
Current ITG practices	<p>Dubai Government organizations are mainly considering on the following ITG practices: ITIL, COBIT, ISO27001, CMMI, and combinations. Some are certified also.</p> <p>We at FAD use COBIT framework to conduct our audits, however auditees don't have to use COBIT in their organizations.</p> <p>FAD promote ITG practices through our ITGAF initiative where we conduct trainings, workshops and reward the most successful organizations in our annual ITGAF gathering conference</p> <p>In an answer to question “does certified mean effective”</p> <p>Yes and no, because based on my observations and audit experience, most of certified government organizations tend to have effective ITG. However it's not a must. Being certified is a good indication because they will have at least the minimal which can be the start toward full utilization of these frameworks.</p>
The extent to which the concept of ITG is recognized, formalized, established and accepted	<p>The average rating for Dubai Government organizations is between low to medium (1.8 to 2.0 on COBIT scale) which based on COBIT between ‘Initial/Ad Hoc’ and ‘Repeatable but intuitive’. However certain organizations got higher ratings such as RTA, DUBAL and Dubai Municipality.</p> <p>The level of ITG awareness in Dubai Government organizations from knowledge wise from 20-40%, however in organization with higher rating they have specialized qualified expertise which demonstrate their better scores.</p>
Main drivers behind adopting certain ITG practices	<p>The main drivers for ITG in DG organizations are:</p> <ul style="list-style-type: none"> - Internal: the interest of top management and awareness/full understanding of its role and benefits.

	- External: exposure to outside, accountability, (FAD role is to ensure compliance however enforcement should be taken by another party “e-gov” to ensure FAD independence as a supreme audit institution for DG)
The Critical Success Factors for effective ITG practices	Top management support and awareness of ITG and the availability of ITG qualified staff.
Difficulties facing effective ITG practices	lack of understanding and knowledge, lack of resources and guidance

Chapter7

Analysis Discussion

Chapter will present a discussion for the analysis tables presented in chapter 6. Analysis will be based on the five main categorization identified in chapter 6 which the analysis tables were based on.

- a. Current ITG practices.
- b. The extent to which the concept of ITG is recognized, formalized, established and accepted
- c. Main drivers behind adopting certain ITG practices.
- d. The Critical Success Factors for effective ITG practices
- e. Difficulties facing effective ITG practices

7.1 Item a. Current ITG practices

Regarding the current ITG practices in the case study organization, they have certain practices already in place. All of them use or utilize certain parts of ITIL for managing the IT service. All of them agreed in the benefits they have gain from ITIL in streamlining the IT service functions. In addition, all organizations use KPI and/or BSC for performance measurement. In general, the use of KPI and BSC is happening for whole organization including the IT department. Another common similarity is that of the have an IT strategy in place that is mapped to the organization overall policy and objectives. FAD IT audits made all Dubai Government organization aware of COBIT framework.

On the other hand, certain organizations such as organization 'B', 'D' and 'E' have gone further in ITG practices in terms of the use formal ITG frameworks and standards. They all share the usage of ITIL, COBIT, ISO27001 and PMI. In addition, based on the interviews and discussions organization 'D' and 'E' have gone further by establishing the Enterprise Architecture (EA) function aiming to supervise, control and manage the utilization of all other standards and practices across the organization. Organization 'B' recently identified the need for and centralized function to manage this and established and EA function that is taking its role in the coming future.

Certain unique practices has been identified with organization 'E' where they use TOGAF and Zachman frameworks to streamline the EA function and this is happening for more than 2 years.

Based on the interview, after starting the function of EA they started a decomposition project to documents and study all processes across the organization in details. This practice allowed them to integrate, remove, enhance, many processes which resulted in enhanced efficiency and improved effectiveness that saved millions on the organization.

Organization 'D' EA function has done similar practices and the fact that they organization itself was started five years back they had the advantage of enforcing best practices without going through the existing cultural change process which happening with the other organizations.

Organizations 'A', 'C', and 'D' heads of IT are members of the organization top management committee allowing them direct access to the top management. The advantages of this direct access was clear as IT strategy formation is part of their overall organization strategy and the fact that IT initiatives are getting all the needed support.

Regarding other ITG practices such the existence of IT committees and working groups which allow IT high presence in the organization, it was noticed that all the organizations have these committees in place except for organization "D" where they have certain committees in place however it is not achieving the high presence of IT across the organization.

Organizations "E" is officially certified with certain ITG practices such as ISO27001, ITIL, ISO 9001, BS25999 and ISO 10002. This reinforces their commitment toward establishing and formalizing ITG practices in their organization. On the other hand, all the organizations agreed that certified doesn't necessarily means effective.

Overall, from the comparison tables the reader can notice that organizations 'B', 'D', and 'E' have more formal (use of standards and frameworks) ITG practices than others. The discussion pointed that organizations 'D' and 'E' formal practices are more established than in organization 'D'. Regarding other ITG practices, there were great examples of working groups and committees that allowed IT higher presence and help them improve their added value services.

7.2 Item b: The extent to which the concept of ITG is recognized, formalized, established and accepted

To measure this area, I will depend on data current ITG practices and some notes from the interviews discussions. All the organizations recognize the concept of ITG and are aware of its practices and main benefits. In terms of acceptance, all the organizations are accepting the use of ITG practices in general as IT department; however acceptance within the organization varies between them. For example, organization 'D' had more acceptances because the whole ITG framework and processes were defined and set in place at the startup of the organization itself five years ago. Therefore, it turned to be a normal way of work for them. On the other hand, for the other organizations they had to change existing culture, processes, practices and especially people mind set. This is totally different and much a harder situation.

Regarding formalized and established ITG practices (use of standards and frameworks), all the organization are establishing using certain formal ITG practices such as ITIL and KPI. However for organizations 'B', 'D', and 'E' they are using formal ITG practices more than others. In addition, the discussion pointed that organizations 'D' and 'E' formal practices are more established than in organization 'B'. Examples common formal ITG practices are ITIL, COBIT, ISO27001, PMI, KPI, and BSC.

7.3 Item c: Main drivers behind adopting certain ITG practices

One of the main common drivers is Dubai Program Excellence award, this demonstrate the value of such awards in motivating and promoting the development of IT best practices. Two of the interviewed organizations, have already won the best IT section of the award. In general, Dubai excellence award is considered one of the main drivers for all government organizations toward positive development from all aspects. In addition another common driver is FAD IT audits and its ITGAF awareness programs. So far, FAD has done great efforts in promoting ITG practices in Dubai government organizations. Their annual audits are considered a major driver for organization to improve the missing areas raised against them in the FAD compliance reports. In addition, ITGAF annual reward for best ITG practices is considered another driver toward effective ITG practices in Dubai government organizations.

Other common drivers include, getting the benefits of ITG practices to help them streamline processes, resolve a problems and improve efficiencies.

One of the main drives mentioned by organization 'E' is to improving efficiency and enhancing effectiveness by integrate all existing ITG practices and make best use of them to avoid silos. They identified the issue of having several practices where each organization use it own framework in silos from others. This lead to duplicated and conflicting processes which was impacting increased cost and reduced effectiveness. Therefore they attempted to resolve this issue by using EA function as the central process design and control function for the overall organization. To accomplish this, they have used formal standards such as TOGAF and Zachman frameworks along with COBIT framework.

7.4Item d: The Critical Success Factors for effective ITG practices

All the organizations agree that management ongoing support is considered the main CSF for having effective ITG practices which is a common factor for any initiative in any organization. I will be focusing my analysis on the unique CSF for each organization with some insights gained during the discussions. This will allow showing what differentiate each organization success factors.

- Clear Strategy

In organization 'A', they consider having clear strategy one of the main factors that allowed IT to be more effective in meeting the organizations requirements. As per the head if IT, "having clear strategy in our organization with a detailed road map plan for each department and section allowed us in IT to build our strategy to be aligned with their clear objectives and plans. Without clear business objectives our IT strategy alignment will be difficult". Based on my observations, organization 'A' had detailed strategy for each business unit that is mapped to the department strategy and overall organization strategy. All these strategies are detailed in term of clear objectives and plans. The same was reinforced by all organization 'C'. The literature discussed this point in details in section 2.3.1 and section 2.3.3 where the ITGI board briefing stated that Strategic alignment between IT and business is one of the main CSF and objectives on ITG.

- Having clear measurement methods such as KPI and BSC:

In addition, the head of IT considered having clear measurement methods such as KPI and BSC allowed them to measure the impact of IT and easily communicate the added value of IT. Organization 'B' and 'D' also reinforced the importance of having clear KPI and measurement and assessing and tasks or services progress and effectiveness. Referring to the literature (section 2.3.2), all presented ITG practices considered having clear measurement and control for IT practices as a critical success factor and a main driver.

- Clear and documented processes from top level to the lowest level

Based on the head of IT, having clear documented processes and procedures for all business activities, saved IT a lot of efforts and allowed them to easily understand and study all the processes to identify improvement and enhancement opportunities. It also helped in integrating certain processes which improved efficiency and effectiveness.

Organization 'C' head of IT also reinforced the importance of having all process defined. In this regard, he pointed that this process was done by the organization quality department where their role and high cooperation was very critical in assisting IT in understanding and design the right solution for business.

Organization 'E' representative pointed that the role of EA started from this point which a detailed study they have done for all business process and their relations and dependencies. They called this project decomposition project which allowed EA to start their role to properly design IT and business processes in the most efficient and effective approach.

Referring to the literature (section 2.3.4) this was the fourth item of the identified CSF which was pointed by Selig, 2008; Symons, 2005; ITGI, 2009; and Weill and Ross, 2005.

- Clear communications

In organization 'A', I have noticed the easy communication and transparency between all the departments. One factor that helps this might be that it is not that very big organization, however based on my observation and the head of IT communication, all the heads of departments actually have the open door policy. As explained by the head of IT, if you have an issue something to be resolved you don't need to send an email; you just go to the person and resolve it on the spot. This is a culture we have; we all work as one team. In addition, during my meeting, many people were coming to head of IT office and he commented "this is a prove for our open door culture"; and he offered me to meet the head of a new function of corporate governance to discuss with him. Actually I accepted the invitation and went directly to his office, he was very welcoming and cooperative which is another prove for open door policy.

In organization 'D' communication is considered one of the CSF. As per the interviewee, we work as one team and we all know each other in IT department which allows for things to move and be solved smoothly. This is main reason behind this is team called Fun Team; this is a team composed of three members from IT and it changes every month to other volunteers. Their task is to arrange a team activity every month. This monthly team activity is participated by the whole IT department including the CIO himself and even the vendors and outsourced staff. This allowed more commitment and easier communication.

Communication was the fifth item of the literature identified CSF were Symons (2005) and Selig (2008) stated that clear two-way communications and good participation and collaboration among the business and IT people allow improved effectiveness of IT.

- It is a culture change process

Organization 'B' stated that one of the CSF for ITG is to consider it as a culture change process. This is very true especially at their organization which is considered one of the oldest and biggest organizations in Dubai. As described by the assistant director of IT department, here people have predefined processes that they were used to do for many years the same way; it is not easy to tell them you need to do it in a new way or you are doing it wrong!! We have to take it step by step, conduct awareness sessions, workshops and so on at all levels. After all for us, It is a culture

change process. Organization 'C' also agrees that it is a culture change process that needs to be planned step by step. The head of IT for organization 'C' points that their staff and customers are not really used to the use of technology. All the work was paper based until recently. Therefore a CSF for his IT department success was taking new IT initiatives and services and a culture change that needs a lot of awareness, communication and people skills in the IT staff.

In this regard change management was one of the key areas discussed by Selig (2008) where managing people and organizational change need to be considered as part of any ITG practice.

- Showing the results especially the big wins

The Head of Application Design & Development Unit in organization 'B' discussed the importance of showing the added value of IT to the organization. As he explains, make sure to show the big wins (things that really matters to key stakeholders). This will ensure continuous appreciation and support for IT and ITG initiatives.

- Simplifying things (not complicate the work)

Another point raised by the Head of Application Design & Development Unit in organization 'B' is to simplify things and take them step by step. Do the whole thing at one time will be very difficult; it is better to start step by step and set priority for the most feasible options. They same was agreed on by organization 'D'. As explained by the IT manager, one of the main CSF for having effective ITG practices in our organization is going toward standards step-by-step which allowed achieving more acceptance and effective culture change. In addition, the head of IT for organization 'C', also confirm the importance of this point saying, we started by using certain parts ITIL to streamline the service level which is our priority at this time. It's not advised to take it all at one time, it will difficult and complicated to implement and be accepted.

In the literature on of the CSF factors for an ITG arrangement was to be simple, scalable and flexible. Selig (2008) considered this as one of the main three pillars for ITG practices and Calder, (2005) considered ease of use or simplicity a key to the ongoing success of an ITG arraignment.

- Management and team willingness to change

This item was pointed by the head of IT for organization 'C', where he considers management and culture willingness to change as a CSF to enable new ITG practices. As he explains, this comes from top management support and cooperation. This point can also be considered as part of management support and the literature discussed this in details in sections 2.3.3 and 2.3.4.

- The high involvement of IT (committees)

All organization agreed on the importance of this point. By this we don't mean involving IT in each and every committee rather than in key areas such as the customer service, strategy, development and whatever the organization considers will be effective based on their organizational structure. As explained, committees and this presence allows IT to have better view on the business needs and how to support them. It is also an important element that enhances communication and provides formal communication and discussion channel. Weill and Ross, (2005) pointed that the use of such committee help to improve ITG to obtain better integration across the organization.

- The use of knowledge resources and expertise

This point was raised by organization 'C' explaining the importance of having access to knowledge resources and IT/ITG expertise. This allows learning from past experiences and finding new and latest solutions. Organization 'C' gave an example that they are using Gartner which a leading IT research and advisory company that deliver the technology-related insights necessary for IT department (www.Gartner.com).

- Conducting IT awareness to Department heads

This was also raised by organization 'C' representative where he considers conducting IT awareness to department heads was a CSF to show what IT can do for them and how we can help them. This is part of communication that provided IT with support from departments heads and bridged the gap between IT and business. Referring to the literature this can be considered part of communication.

- The use of mature ITG frameworks and customize it to our needs and environment.

Organization 'D' and 'E' considered the use of mature ITG frameworks and customizing them based on needs and environment as CSF. This is it gave them a clear road map based on experiences and proven by multiple reviews. However, they pointed the importance of customize these frameworks to meet their unique and changing needs. Otherwise, it might not work as anticipated. This reflect the 'don't start from scratch' CSF in section 2.3.4 were Symons (2005) advised to not to be afraid from borrowing from ITG best practices to take what is needed aiming to improve your ITG arrangements.

- Managing ITG practices and initiatives through a central function

This point was raised by organization 'E', where after deploying so many standards and ITG practices they noticed the importance of centrally managing them otherwise there will be conflicts, duplicated process and processes that are not aligned with the organization/department objectives. They called this function Enterprise Architecture (EA) and they utilized EA industry common standards to help them in this regards such as TOGAF and Zechman.

The same was done by organization 'D'; they called this function as IT Governance and Project Management department. Item 15 of the literature review CSF enforced the point to have an integrated plan at the implementation side which was supported by Symons (2005) in his model.

7.5 Item e: Difficulties facing effective ITG practices

Regarding the main difficulties they have faced, most of them responded saying the opposite which is obvious, however the concentration was for the organization experience and situation. Following were the main difficulties.

- Findings qualified resources

All of the organizations agreed on this difficulty because their qualified resources are leaving for better salaries and they can't adjust their situation due to the general budgets freeze on all Dubai government organizations after the recent financial crises.

- Budget issues due to financial crisis,

In general, all the organization agreed on this difficulty also which shared under recent financial crisis not only for IT, it's for the whole business. However, there is clear direction in these organizations that this financial crisis opens their eyes on the importance of ITG in achieving efficacy. Organization 'E' representative revealed that after doing this in their organization their savings for this year were by millions of Dirham's.

- Conflicts between organizations systems and other enforced IT systems

Conflicts with the system that are being enforced on all Dubai government organizations by higher authorities. These systems don't match their unique needs and whenever changes are needed it takes long time to apply. More communication and transparency is needed to improve this cooperation.

- No direct access to top management for IT.

Mainly Organization 'B' IT department don't have direct access to the top management where they are not part of the top management committee. This have an impact in reduce IT access and presence in the organization. As per section of 2.3.4 of the literature review, Weill and Ross (2005) stated that IT being part of organization top management committees and IT strategy formulation part of organization overall strategy are of substantial importance in enabling and making ITG initiative more effective

- The organization culture and willingness to new changes. It's a lengthy process

This is the opposite where organization 'C' considered it as a CSF; organization 'B' considered it as a difficulty. Part of resolving this issue is improved communication and taking it as culture change and part of an integrated implementation plan which take into account all stakeholders.

7.6 Comparing organizations case study analysis with the expert interview

After presenting the analysis based on the identified five groups, it will be useful to compare this discussion with expert interview findings (Table 6.6). The comparison will be based on the same five categories however the discussions will be about Dubai Governments in general since the expert interview discussions were based on this.

- Current ITG practices

The expert confirmed the organizations case study that Dubai Government organizations are mainly considering on the following ITG practices: ITIL, COBIT, ISO27001, CMMI, and combinations. Also, that not all of them are certified with these standards and practices.

In addition, regarding the FAD role in ITG practices, they conduct regular IT audits for Dubai government organizations (all case study organizations has been audited by FAD, however I was not given the details of the audits due to certain privacy issues) based on CBOIT framework. Moreover, ITGAF (an initiative by FAD) has conducted trainings, workshops and rewarded the most successful organizations in their annual ITGAF gathering conference aiming to promote ITG practices in Dubai government organizations. They also have a formal collaboration agreement with ISACA organization which is in the field of ITG.

- The extent to which the concept of ITG is recognized, formalized, established and accepted

The expert provided the average rating for Dubai government organizations to be between 1.8 to 2.0 on COBIT scale which based on COBIT described as between ‘Initial/Ad Hoc’ and ‘Repeatable but intuitive’. However, he point that certain organizations got higher ratings such as RTA, DUBAL and Dubai Municipality.

Comparing this to organizations case study, I assume this average is higher for the organizations I interviewed. This might be because I selected organizations with higher ITG knowledge and in place practices. On the other hand this rating applies to organization ‘A’, and organization ‘C’ based on the explanation provided in table 6.

The level of ITG awareness in Dubai Government organizations from knowledge wise from 20-40%, however in organization with higher rating they have specialized qualified expertise which demonstrate their better scores. The same applies here, however in the five organizations I met the knowledge about ITG was from 50% and more. This will be based on their overall rating for all Dubai Government organizations.

- Main drivers behind adopting certain ITG practices.

The expert has classified the main drivers for ITG in DG organizations into two:

Internal: organizations top management interest and awareness and understanding of ITG role and benefits. And the availability ITG experts in the organization.

- External: exposure to outside, accountability, (FAD role is to ensure compliance however enforcement should be taken by another party “e-gov” to ensure FAD independence as a supreme audit institution for DG)
- Comparing these drivers to the organizations case study drivers we can see that the expert input reinforce these drivers as main drivers in Dubai Government organization.
- The Critical Success Factors for effective ITG practices

The expert considers top management support and awareness of ITG as the main CSF for ITG in Dubai Government organization. In addition, the availability of ITG qualified staff and experts.

The expert view on the main CSF confirms the drivers I have reached in my case study which confirms it (refer to table 6.5)

- Difficulties facing effective ITG practices

He mentioned lack of understanding and knowledge about ITG practices and its benefits as the main difficulty along with lack of resources.

Again the expert view on the main difficulties confirms the I difficulties have reached in my case study which confirms it (refer to table 6.6)

7.7 Summary

This chapter presented analysis of collected data based on the defined five categories. The analysis presented some connections within and between the categories. In addition, certain connections and referring to the literature review were made for further analysis. Moreover, we presented a comparison between the findings of organizations case study with the expert interview main findings based on the five identified categories. The connections pointed multiple relations between identified objects that will help in the results and recommendations chapter

where we will present the analysis main finding, results and recommendations regarding ITG practices and ITG practices in Dubai government organization.

Chapter 8

Conclusion and Recommendations

This chapter will present the research main results and findings along with the applicable recommendations. In addition it will present the research conclusion and possible related future work.

8.1 Results

After presenting the five case studies, their analysis and comparisons with the expert view and literature review, it is important to present the main results toward the research main objectives. The research main objectives were:

- To investigate the extent to which the concept of ITG is recognised, formalised, established and accepted in Dubai Government organizations.

In this objective I was aiming to find out about the level of awareness regarding ITG in Dubai government organizations. The investigation was looking at ITG awareness from different incremental levels:

- Starting with being basically recognition
- Then having the concept formalized where certain formal ITG practices are being utilized
- After that, if the concept already established and ITG practices are in place where its added value being recognized
- Finally, the acceptance side of ITG from management side, IT side and even users side.

The finding for this objective is that the concept of ITG is recognized at all Dubai government organizations. This generalization is not based on my research rather than the expert input where he is in a position to give formal generalization rating for Dubai Government organizations. My research case study found the same for all five interviewed organizations. In terms of ITG being formalized, the results are that all the organizations in my case study are using or utilizing parts of formal ITG practices mainly the ITIL and the KPI frameworks. However, three of the case study organizations have the concept of ITG formalized more where they are using or utilizing multiple ITG practices such as ITIL, COBIT, ISO27001, and KPI. Having more formalized ITG practices infer the degree and efforts of establishment for ITG practice these organizations. On the other, hand these results has been confirmed based on the expert interview that the average

rating for ITG practice in Dubai government organizations is between 1.8 to 2.0 on COBIT scale which based on COBIT is described as between 'Initial/Ad Hoc' and 'Repeatable but intuitive' keeping in mind that he confirmed that certain Dubai government organizations achieved higher ratings and have remarkable ITG practices.

These findings are considered as an indication for ITG practices in Dubai government organizations and that on general it is going in the right direction especially with FAD continues efforts in promoting ITG practices.

- Evaluate current ITG practices and identify the main drivers behind adopting or seeking to implement certain ITG practices in Dubai Government organizations.

Regarding this objectives, the current formal (formal standards or frameworks) and normal (practices that are internal to the department but fall under ITG practices) ITG practices has been identified for the five case study organizations. Regarding the main drivers for adopting ITG practices in Dubai Government organization, certain drivers were identified as common key drivers such as complying with FAD IT audits, the Dubai Excellence Award Management knowledge and push and the realization of the benefits and added value of having effective ITG practices in these organizations. Regarding the Dubai Excellence Award, it is considered one of the main motivators for Dubai government organization in all governmental excellence including excellence in IT. Adding an IT section to the award motivated Dubai Government organizations to seeks IT best practices and effectiveness in their IT arrangements. FAD IT audits is considered that starting point for formal ITG practices in Dubai government organizations and their efforts in promoting ITG practices through ITGAF has been very effective. Although FAD is not an enforcement authority which is a missing part of ITG practices in Dubai government organizations (at least enforcing minimum ITG practices), however as per the head of IT audit in FAD this enforcement is coming into place soon through another official authority that will have the authority to enforce certain ITG practices in Dubai Government organizations similar to what happening in USA and Europe (presented in literature review section 2.3).

Organizations top management awareness regarding ITG practices and its added values was also considered one of the main drivers for effective ITG practices. This knowledge will allow them to direct their teams to adopt and effectively utilize ITG practices in their organizations. In the

case study, two organization (organization 'D' and 'E') ITG practices were considered as effective based on my personal observations, the certifications they have, awards they have received and the FAD – ITGAF award they have received.

- To identify the Critical Success Factors for effective ITG practices in government organization.

Regarding the critical success factors that lead to effective ITG practices in an organization, the researcher first extracted a list of CSF from the literature review based on past academic research, best practices, and industry guidelines. After that, a second extraction happened during the case study for five of Dubai government organizations to get the view from the field and the real experience of organizations in Dubai facing all the factors that applies to Dubai government organizations making it especial CSF for Dubai government organizations. Both extracted CSF has been compared and similarities were found which enforced the identified CSF that can be considered unique to Dubai government organizations. Following is a list of identified CSF leading to an effective ITG arrangement:

- 1- Strategic IT Business Alignment
- 2- Executive management buy-in and continues support
- 3- Clear definition and allocation roles & responsibilities (the who)
- 4- Defined Policies, Procedures and processes
- 5- Communication and transparency
- 6- Resource management
- 7- Risk Management
- 8- Delivery of business added value through IT
- 9- Compliance
- 10- Ongoing Performance Management
- 11- Simple, scalable and Flexible
- 12- Don't start from scratch
- 13- Integrated within enterprise governance
- 14- ITG is a continuous life cycle
- 15- Integrated implementation plan is required

These CSF (detailed in section 2.4.4) will help organization making sure any selected ITG approach doesn't miss any of the main key factors to have an effective ITG. In this way, organizations can use these CSF to measure current ITG practices in general and thereby seek improvements in their current framework either from current model or utilize other frameworks to achieve the needed.

8.2 Conclusion

This research has presented the dissertation main aim and objectives which are mainly about ITG practices in Dubai Government organizations. The three main objectives were:

- To investigate the extent to which the concept of ITG is recognised, formalised, established and accepted in Dubai Government organizations
- Evaluate current ITG practices and identify the main drivers behind adopting or seeking to implement certain ITG practices in Dubai Government organizations
- To identify the Critical Success Factors for effective ITG practices in government organization.

Moreover, the research presented a literature review which discussed the main topics related to ITG. The Literature started by presenting the reader background information on the importance of IT in current days and then moves to present the concept of CG as the base for ITG. Then other topics were presented such as ITG drivers, ITG practices and ITG critical success.

After the literature review chapter, the research presented the case study context chapter where it presents an overview about Dubai, IT in Dubai and ITG in Dubai. This was to guide the reader to better understand the research scope which is Dubai government organizations. Understanding the environment surrounding ITG in Dubai will help to better understand the topic and activities in Dubai from different aspects.

After that, the methodology chapter was presented detailing the research framework. It started by showing the extraction of research questions and research objectives. The research framework was based on the research onion (Saunders *et al*, 2007) which included the following sections; the research philosophy, approach, strategy, choices, time horizon and sample selection. As

presented the research was strategy inductive and qualitative approach was taken for the research which leads to the use of qualitative data collection and analysis methods.

The case study chapter demonstrated the conducted case study which was for five organizations from Dubai government in addition to an interview with an expert who was the head of IT audit from Dubai FAD. It was specifically on their IT departments aiming to reach the identified research objectives through semi-structured interviews to allow more discussions to take place and insights to be noticed. Then the case study analysis was conducted to identify the relations between data and to extract main findings related to the research objective.

Based on the collected data, case study findings and conducted analysis; recommendations were suggested. Some recommendations were general to improve ITG practices in Dubai government organizations in general and others specific to each organization as main points to improve their ITG practices.

In general, there are no much of previous studies about ITG in Dubai and that FAD had already conducted several detailed case studies about ITG in Dubai government organization which if revealed; it could have been very useful source for my research. In my research, I have constructed the base for further studies by providing the basic information about the current status of ITG practice in Dubai government organization. Hopefully, my research will guide and lead into further future studies.

8.3 Recommendation

After presenting the research main results and how they meet the research objectives, based on my observations and research, I am going to present certain recommendations regarding ITG practices in Dubai Government organizations. The main recommendation are the identified CSF (section 2.4.4), however following are other recommendations:

General Recommendations:

- Use the CSF in you selecting and evaluating your ITG practices.
- Since FAD is an independent body that enforcing interfere with its function as supreme audit court in Dubai, enforcement of ITG practices (at least the minimum) need to be delegated

to another party with clear roles and responsibilities in this regard. As per FAD head of IT audit this is an under process thing and the need already identified.

- Although FAD IT audits has been very useful, some organization raised that needed more help in this regard since they don't have the qualified ITG expertise. Therefore, it is recommended that FAD provide guidelines on how to understand and implemented their recommendations or even developing some kind of brief booklet guiding them how to go forward in resolve the raised issues and even improving their ITG practices in general.
- For organizations adopting multiple ITG standards and best practices, a central function to manage them is critical to avoid making ITG different practices to work in silos resulting in reduced efficiency and effectiveness.
- Communication is critical any project success at all levels. Part of communication is between the IT departments staff themselves.
- The use of applicable knowledge resources and data bases is highly recommended. It assures accurate updated knowledge in the different IT fields. This can be a service provided by FAD or any concerned governmental entity.

For Organizations:

- Organization 'A' needs to better establish ITG through formal practices. Also, document current ITG activities to reach to the establishment of their overall ITG framework. This will reduce the ad-hoc practices risks. In addition, they are advised to further develop ITG skills for the IT staff. This will assure better implementation for their ITG plans.
- Organization 'B' is advised to further integrate their ITG practices into one overall framework that centrally govern all the standards. Aldo, more awareness for IT staff regarding the clear plans for the overall ITG framework will assist to increase acceptance levels.
- Organization 'C' also needs to better establish ITG through documented formal practices. And internal ITG expertise needs to be developed to carry on head of IT efforts.
- Organization 'D' is advised to carry on the great success and concentrate more on further developing internal resources and more control on outsourcing management since most of their services are outsourced.

- The main advice for organization 'E' is to improve the communication between IT staff to reach a level where all of them know each other. This will be critical in improving the cooperation between all IT departments.

8.4 Research Limitations

In this research there are certain limitations. One of the main limitations was lack of previous research and not giving the research access to statistics and details that were available with certain entities. The case studies themselves have certain limitation such as the credibility of the qualitative data and that the interviewed person is really reflecting the organization real situation. Although the researcher was not given documents and statistics to prove interviewees responses, the researcher did his best to follow interviewing guidelines especially for qualitative data gathering.

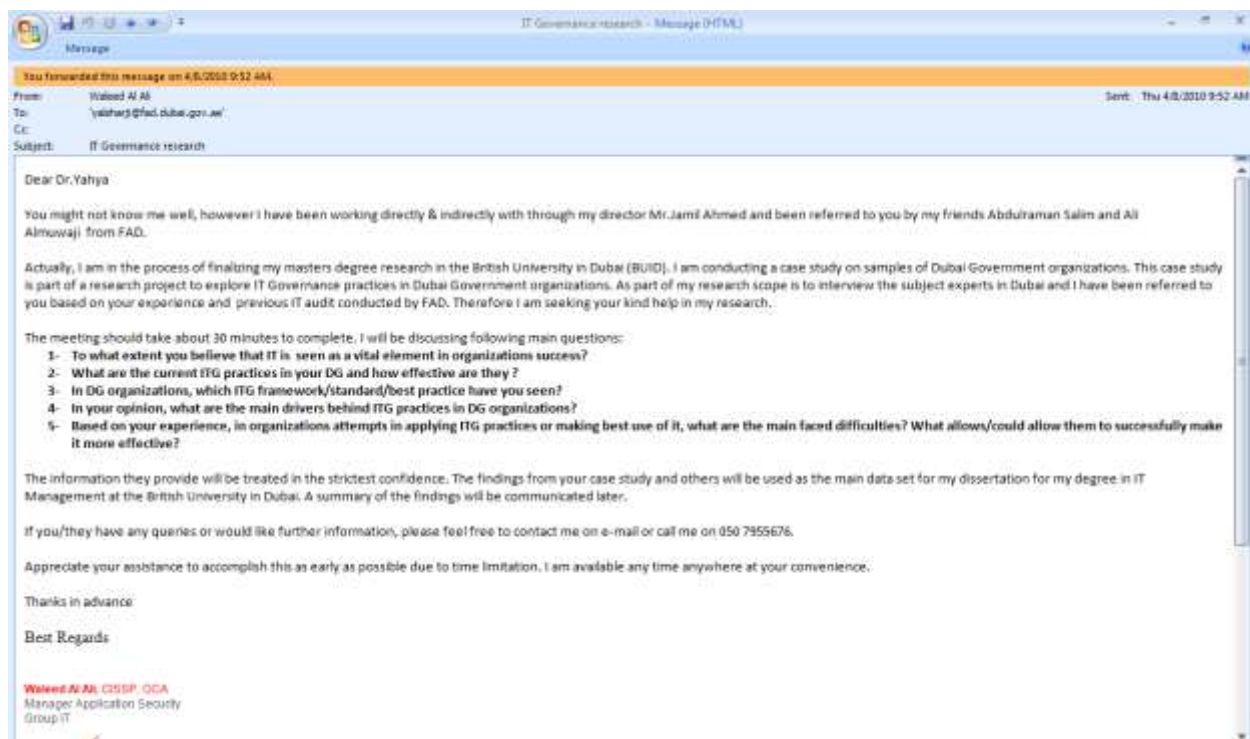
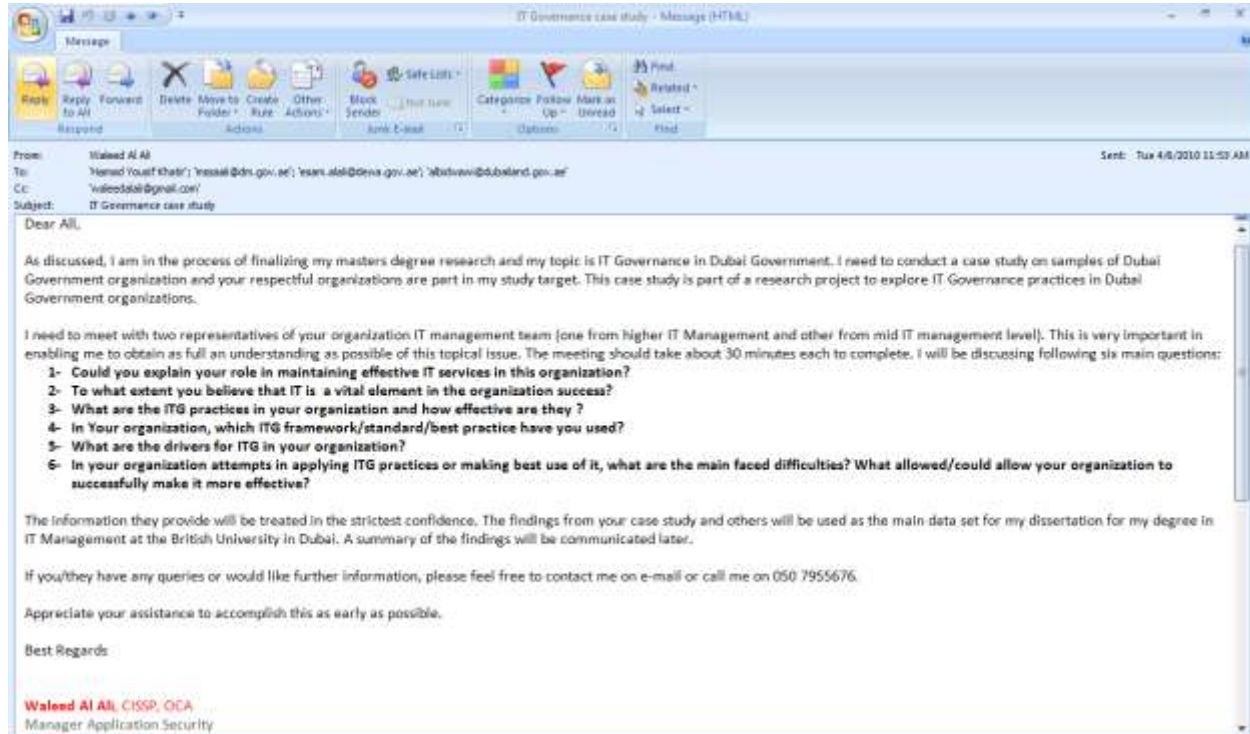
The scope was a sample of Dubai government organizations and doesn't generalize to all Dubai government organizations; however certain general findings were generalized based on the expert feedback, who is in a position to generalize based on his current profession as the head of FAD IT audit.

8.5 Suggestion for Future Research

This research presented and discussed the current view of ITG practices in Dubai Government organizations. This is considered just a starting point where there are others subjects that can be further researched and studied such as the following:

- The maturity levels of ITG practices in Dubai Government organizations.
- The impact of employing ITG practices on the organization overall performance.
- The role of ITG practice in reducing the impacts of the financial crises.
- FAD IT audits and its impact on ITG in Dubai Government organization.
- Effective ITG role in enhancing enterprise corporate governance.

Appendix (A): Case Study Communication



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