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IT Governance Framework For E-Government

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Abstract

E-Government (EG) management represents a challenging task for many stakeholders. As an emerging notion, IT Governance (ITG) represents an opportunity to fulfil different strategic objectives including EG. However, research on the impact of ITG on EG development-phases and success is limited. Thus, the objective of this research is to investigate how ITG could be extended to EG and attempt to develop an ITG framework to assist govern EG. This exploratory research uses qualitative data to investigate how ITG elements impact EG development-phases. The application of the proposed ITG framework makes it possible to enhance and improve the development of EG.

Keywords
IT Goverananance, E-Government

INTRODUCTION

Over the last ten years corporate governance (Auguilera, 2006; Mueller, 2006) has become a major research field. However, in recent years alignment with the Information technology along with corporate governance is developing a new research field. It has been a long running debate in the IT research field that the use of IT in businesses and governments to what extent creates and retains value. Use of Information and communication Technology (ICT) by government organizations for EG is mainly to provide services to citizen in an effective and efficient way. Therefore, EG should be managed and delivered without the limitation of time and distance to produce high level of productivity and effectiveness in terms of e-services. The key theme in EG is the provision of high quality e-services in supporting the development of a competitive knowledge-based economy (Traunmüller, 2004). The government organizations must comprehend quality of EG services as the most significant factor in order to gain efficiency, worthiness, transparency and trust. To achieve all these important factors ITG can play an important role. The government entity is responsible for development of EG must have employed ITG to deliver better quality of services to the citizen, business or other public entity.

According to the IT Governance Institute (ITGI), the term can be defined as "an integral part of enterprise governance and consists of the leadership and organizational structures and processes ensure that the organization's IT sustains and extends the organization's strategies and objectives" (ITGI, 2006). To achieve high quality services, ITG has emerged as an important issue for government organization. While there are many ways to govern IT and many standards developed by IT professionals, there is still not one size fits all way to ITG. In addition, there is little known concerning the outcome of ITG practices in UAE organizations. The study attempts to address the general research question, how public organizations in the UAE can govern their EG projects effectively. Finally the proposed generic ITG framework will help in improving EG projects to achieve better quality services effectively.

RESEARCH BACKGROUND

IT Governance (ITG): The term 'governance' in IT provides a broader description of policies, structures and management of processes related to IT functions (Brown & Sambamurthy, 1999; Weil & Broadbent, 2000; Sohal & Fitzpatrick, 2002). ITG is rather new as a concept but it is a natural phenomenon. The ITG is embedded in the culture, internal processes and work practices of an organization naturally and it has resulted in the social behavior perspective of ITG in an organization. Early definitions of ITG given by many researchers (e.g. Henderson & Venkatraman 1993, Luftman et al 1993, Brown and Magil 1994) considered IT decision making and responsibility of IT as a core. Recent definition of ITG drives from the concept of corporate governance. This study adopted the definition given by Weill & Ross (2004) and Van Grembergen & De Haes (2009). Weill and Ross (2004) described that "effective IT governance is the single most predicator of the value an

organization generates from IT"(pp. 3-4). Distribution of decision authority is generally deal by ITG (Sambamurthy &Zmud 1999; Tavakolian 1989) and to set priorities and allocate IT services with processes at different levels (Luftman & Kempaiah 2007, p.166) and it " also involves in ensuring regulatory compliances and managing external partners"(Luftman & Kempaiah 2007, p.171). A more comprehensive definition of ITG postulates that ""enterprise governance of IT addresses the definition and implementation of processes, structures, and relational mechanisms that enable both business and IT people to execute their responsibilities in support of business/IT alignment and the creation of value from IT-enabled business investments" (Van Grembergen & De Haes 2009, p. 1). Research has depicted that at least 20 percent higher returns on assets result in those organization adopted proper ITG than those with weaker governance (Weill, 2004). In ITG research, Wiell & Ross framework represents convergence and aggregation of the two streams defined by Brown and Grant (2005). A typical ITG framework is used to describe the Structures, ITG Processes and mechanisms related to IT key decisions in an enterprise (ITGI 2003, Weill & Woodham 2002, Weill et al 2004, Van & De Haes 2004) as shown in Figure 1.

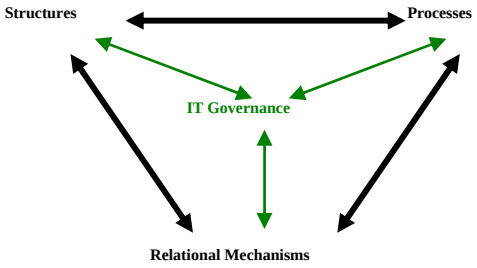

Figure 1: Main elements of an IT governance framework

E-Government: EG is about communication between government and its citizen by means of computers or Wide Area Networks (WAN). World Bank defines EG as it refers to the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses and other arms of government (World Bank- e-Government). EG is categorized into different types of service opportunity i.e. Government to Citizen (G2C), Government to business (G2B), Government to Government (G2G) and Intra government internal efficiency and effectiveness (IEE) (D.Evans & D.C. Yen). Definition of E-government given by Grant and Chau (2005) after a review from several studies is:

"A broad-based transformation initiative, enabled by leveraging the capabilities of information and communication technology; (1) to develop and deliver high quality, seamless, and integrated public services; (2) to enable effective constituent relationship management; and (3) to support the economic and social development of goals of citizens, business, and civil society at local, state, national, and international levels (p. 9)". This definition provides an insight into the importance of enabling role of IT and the complexity of EG. Most of the studies address the connection between EG services and ITG on a contextual, fragmentary and in many cases theoretical basis. But few of them addressed the importance of ITG for EG successful implementation and efficient working. A life cycle of EG service delivery capabilities depicted in sequential stages (e.g., Ke and Wei, 2004; Layne and Lee, 2001; West, 2004). In many cases, most of the implementation of EG didn't progress to the third or fourth stage as defined by Layne and Lee (2001) maturity model. To improve the service delivery of EG and to reach the 4th stage of maturity model, ITG is one of the important factors as identified by Montazemi et al (2010). In implementing EG efficient service delivery initiatives strategic mechanisms of ITG are considered important factors (Butler and Murphy, 2011; Luna-Reyes et al., 2007; Tsai et al., 2009).

Around these facets as shown in figure 1 along with ITG outcomes research was framed.

ITG FRAMEWORK FOR E-GOVERNMENT

Very few of the studies discussed the role of ITG for e-Government development phases. But none of them addressed the issue of ITG framework formulation specific to EG development phases. For formulation of ITG framework this report laid the ground work as described above under theoretical background. The three pillars of EG governance success defined by US department of the Interior (2003) i.e. Leadership, Organizational structure and process management, can also be the part of ITG framework for EG. Figure 2 is the proposed ITG framework for attaining the real benefits of the EG service delivery. Three stages are defined for the development of EG i.e. Planning Phase, Implementation & Delivery Phase and final phase is the Evaluation phase. EG first Phase is the Planning phase that includes the strategic planning commitment and scope for the development of EG. This phase also includes definition of performance measurement & targets, Process

architecture, performance gap analysis and business & technology architecture. During Planning Phase of EG development, ITG '*Structure'* element must be the part of it, for the identification of objective, definition of organization structure and can use governance matrix to describe governance styles. IT strategy alignment and Infrastructure & Architecture standard definition for EG are part of this phase. The second phase of EG i.e. Implementation and delivery phase includes Process analysis, design, development and delivery mechanisms. ITG framework second element *'ITG processes'* is the part of second phase of EG development i.e. Implementation and delivery phase. ITG processes frameworks can be used in combination throughout the whole life cycle of EG implementation e.g. Publish information, Interaction, transaction and integration with different other government services. Other environmental variables such as political issues, education & marketing, work force, cultural problems like Digital Divide, E-literacy, Trust, Privacy and security issues can also keep into consideration. In EG third phase i.e. Evaluation that includes the performance monitoring, auditing and management. ITG outcomes measurements can be utilized during this phase such as IT balanced score card, Key performance indicators or maturity models. It helps to evaluate the ITG significance for EG.

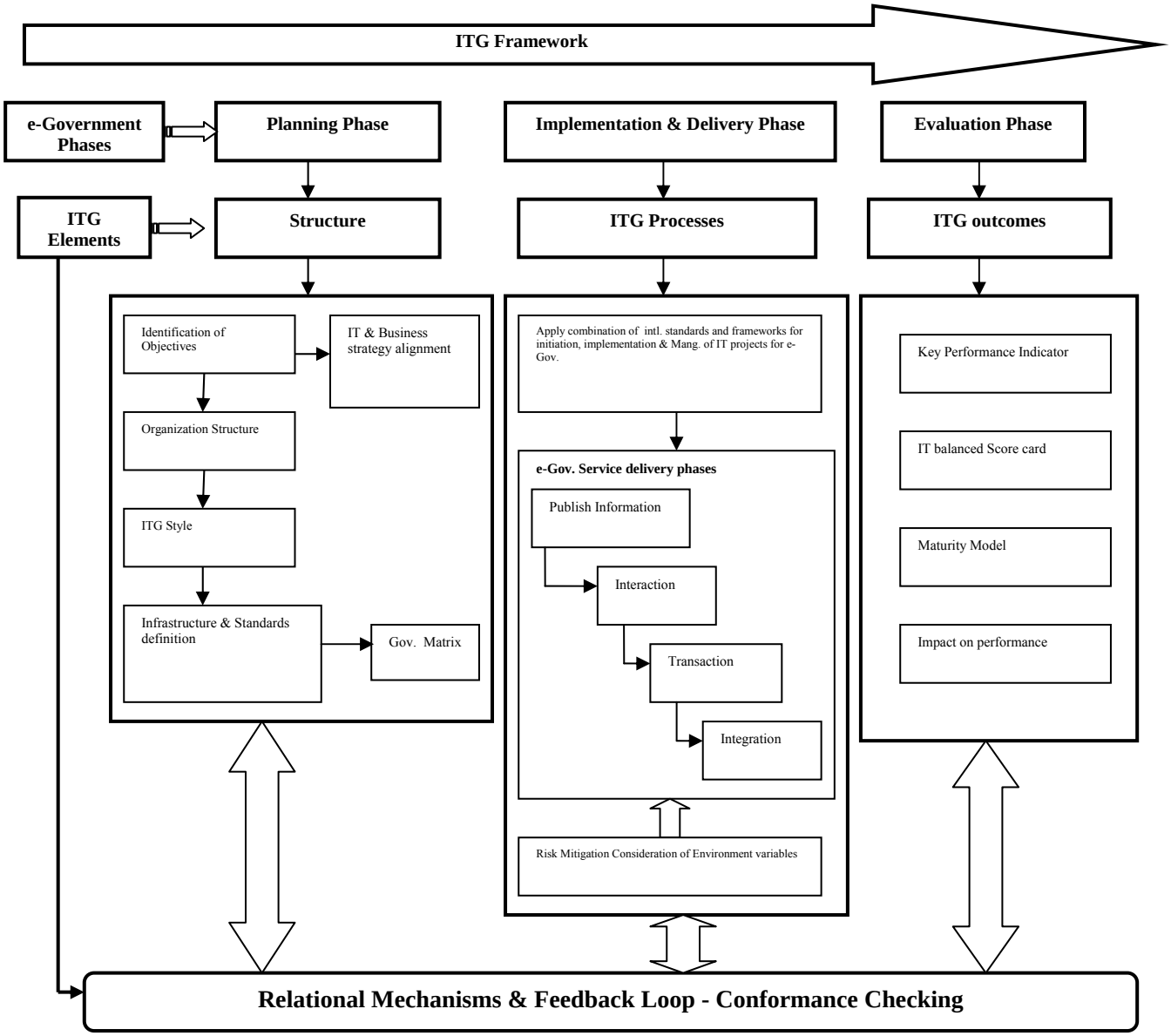

Figure 2: ITG framework for e-Government development

The third element of ITG is *relational mechanisms* that enable us to track the significance of ITG. It can be used in each phase of development of EG. From each phase there must be feed back loop that enable us to put things in the right form if they are not. Conformance checking also enables us to verify that every thing is according to the regulations or not. Finally, after using this ITG framework for the EG, we can able to assess its impact on the service delivery performance that is main purpose of using EG & ITG.

RESEARCH METHODOLOGY

Research Objective & Method

The main objective of the research is to define a generic ITG framework for EG development and analyse how ITG carried out in Government Entity (GE) which is responsible for EG development & implementation in U.A.E. A descriptive Case study method (Yin, 2003) was chosen for this research with qualitative approach. This study is interested to answer the following main Research Question (RQ):

RQ1: How can public organizations in the UAE govern their eGov projects effectively?

By exploring the foundations of ITG that includes mixture of Structures, IT processes and relational mechanisms (DE Haes & Van Grembergen, 2006), ITG can be deployed as described above in research background. To find out how these elements are being applied under this main general research question this study attempts further to address the following sub-questions:

RQ1 (a): What type of ITG style exercised by Governmental organizations for EG in the UAE?

RQ1 (b): What is the adopted ITG process in Governmental organizations for EG in the UAE?

RQ1 (c): What are the ITG relational mechanisms used by Governmental organizations for EG in the UAE?

RQ1 (d): What measures used to evaluate ITG outcomes in Governmental organizations for EG in the UAE?

Combination of semi structured interview questionnaire, documentation analysis and observation techniques were utilized for data collection. It provides in rich and in-depth understanding of ITG practices in Government organization. The face-to-face interviewees were conducted with the top management and ITG personals over a period of two month as part of on-going research. Questionnaire design was addressed carefully because poorly designed questionnaire may not produce the intended information. To drive the design of questionnaire, goals of study have to be clearly defined. Most of the interviews questions are open ended questions as open ended questions are better and preferred over closed ended questions because sometimes they provide additional information. Developed interview questionnaire is combination of different survey questionnaire (ITGI & ISACA, 2011; Perko, J., 2008, Xue, Y., et al., 2008) that has been previously developed for ITG data collection.

CASE STUDY & FINDINGS

Case Study Background

A Government Entity (GE) was chosen as a case study to address the research questions. GE was created as a committee to develop and support various ventures within Governmental transformational program in UAE. It is responsible for IT agenda that includes supervision of the EG program implementation in Government Entities (GEs); Sponsoring of critically important EG project initiatives, assets & competencies; Policies & technology proposals; Issuing of rules and guidelines for implementation of IT policies and technical specifications and communications between GEs.

Questionnaire Findings

As we wanted to explore that how ITG was applied at GE. They started practice of ITG since 2005 as GE was created. Findings of the questionnaire are arranged around ITG elements Structure, ITG Processes, Relational mechanisms and ITG outcomes. One Respondent is from operations department and other Respondent is from IT strategy section of Strategy and planning department.

ITG Structure in GE

Interviewees confirm that GE structure contained a section for IT strategy. For EG deployment, some of the decisions are made by the IT strategy department and for implementation operations department is responsible. Some of the decisions are centralized while in some cases they follow decentralized approach. They also provided the organization structure and described that IT strategy section is responsible for identification of objectives, IT alignment with business strategy and Infrastructure & standards definitions. Figure 4 showed the IT Architecture & Standards Governance framework.

It includes following phases:

Communicate: Workshops & focus groups are organized by IT teams to explain governance processes and understanding of new technologies. Training & educational courses are also provided for all components of the IT Architecture & Standards. For EG development purpose training is provided to Government entity to assess the integration maturity level.

Apply: GE apply approved policies, standards, projects and initiatives for Governance & Buy-In from all GEs as required for proper management. For new technology standards and best practice polices, GE applied a thorough assessment and buy-in process that also incorporate the GE IT Architecture & Standards.

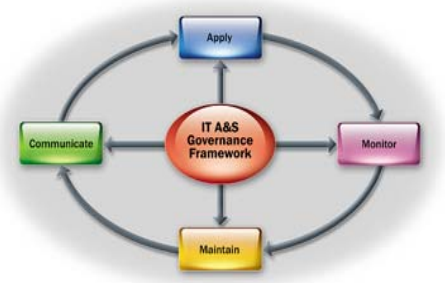

Figure 3: GE IT Architecture & Standards Governance Framework

Monitor: A Customer Service & Support is provided by GE to all collaborative GEs for submission of enquiries or request. GEs have to comply with GE IT Architecture & Standards and receive the "EG Compliant" logo and benefits. For change management purpose, auditing has been done and results are feed to the change management function.

Maintain: Regular updates has been done for IT Architecture & Standards Maintenance and handled by specialized technologists including removal of obsolete technologies or modification to standards. Research & Benchmarking has also been utilized by GE for constantly emerging technologies.

ITG Processes in GE

Interviewees explained that for the ITG processes, GE is following internationally developed frameworks & standards as a reference. COBIT (Carroll, Ridley & Young, 2004) is for the ITG life cycle reference model as a main source of guidance and ITIL (kim, 2003) is fully implemented at operations level for EG. They have well trained employees with international certifications like COBIT, ITIL and TOGAF. Some of the IT activities are fully outsourced like IT helps desk and End user support. Some of them are partially outsourced such as Infrastructure provisioning & maintenance and application development. GE is using a combination of Information security frameworks like ISO 17799, BS15000 and COBIT for ITG named as InfoSac. They claimed that GE is following best ITG practices but still there is a room for improvements in terms of effective IT control framework in order to achieve clear roles, accountabilities and responsibilities.

ITG Relational Mechanisms at GE

Interviwees confirms that for the continues monitoring of emerging technologies and related potential business apllications they assigned responsibilties to concerned department. Special funding mechanisms and investment appriasal provided to perform pilots with new emerging technologies.

ITG outcomes at GE

Interviwees believe that for better service delivery of EG services performance is the most important factor. The reason of using ITG at GE is for better service delivery, effective use of IT for assets utilization and business flexibilty. They claim that their IT projects at GE completed on time, ensures implemented with all features and function as specified in proposals but some times they are over budget.

DISSCUSION

It was clear in this research that ITG represented a building-block for successful EG development. Every society has different priorities and needs and accordingly, there are different models for EG and ITG. For EG to succeed, the important pre-conditions for EG are fully dependent on the society's most important needs. EG's quality-of-service-delivery depends on the organizational Information & Communication Technology (ICT) management which enhance the automation of collaborative-processes and the provision of new integrated

services. As it was demonstrated here that utilizing an ITG framework could help the successful uptake and implementation of EG. In the case study, three important drivers were identified: Quality of service, Customer service and Innovation which constituted the organizational strategy. To attain these objectives, ITG proved its effectiveness here. It was found in this research that the model followed by GE matched the Federated one i.e. hybrid of central and decentralized models. It was found that the case used the Governance Matrix to capture the governance style adopted by GE. The case used IT monarchy governance style as explained by interviewees but this was not clear enough to warrant the made conclusions. As EG is an existing foundation with clear business objective, its IT principle and IT investment domains must be sought from the Business monarchy domain. GE believed that for the effective governance of IT, the following enablers must be available: frameworks, Tool Kits that support the implementation of- or the enhancement of existing ITG, and benchmarking capabilities. Understanding the impact of IT on the continuity of business and other IT-related risk management issues are highly emphasized here. This research found that Governance of IT Architecture & Standards is defined in the case but it was limited to the basic components that contain general Apply, Maintain, Monitor and Communicate phases. It is suggested here that in order to ensure the effective use of ITG for EG development, GE must focus on initiation and implementation phases of new IT projects. For initiation, management and implementation of new IT projects like infrastructure or the introduction of new IT technology, ITG frameworks such as COBIT, ITIL and international standard like ISO 17799 or combinations of these approaches are recommended. COBIT support the whole ITG life cycle, while ITIL is best for IT service management support and ISO 17799 is ideal for information security. Six Sigma (Nonthaleerak, 2006) can also be used for monitoring purposes to achieve i.e., zero-defects results, risk mitigation. GE developed framework for ITG based on BS15000 and part of COBIT. It is recommended to revise this framework considering ITG outcomes as important elements in the evaluation of EG. The significance of ITG can be measured by using different methods. Analysis of the research findings suggested that GE is at maturity level four of ITG as identified by COBIT (Carroll, Ridley & Young, 2004). The case confronted several challenges while using ITG in EG development such as change management, getting required participation from businesses, difficulty in demonstrating values and benefits. For the first two barriers, ITG relational mechanism can address these issues and ITG outcomes-measurement mechanisms can help in shedding more lights into values and benefits. In adopting any framework, organizations must address four major entities such as Structures, Processes, Relational mechanisms and Outcomes measurements (SPRO):

Structure: Under Structure, there must be defined reporting relationship. For effective ITG structure one of the best approaches is CIO reports to the CEO as proposed by Symons (2005). Governance Specific positions must be defined by GO.

ITG Processes: For ITG processes enforcement must be articulated by IT portfolio management, Service level agreement, Charge back mechanisms and demand management (Symons, 2005).

ITG outcomes: Measurement is very important and also key piece of communication strategy. GE and collaborative GEs must have to develop a team for monitoring ITG outcome, for that they may use IT balanced score card strategy or define key performance indicators that can be conveyed by using relational mechanisms.

Relational Mechanisms: To get effective ITG, it has to be communicated throughout the collaborative government organizations. As GE is responsible for defining guidelines & standards for EG services and implementation was done by GEs according to regulations defined by GE. IT Portal can be introduced between collaborating parties as in this case GEs to communicate effectively.

Limitations and Future work

Our findings and thus assessment are limited in two ways. Firstly, our study is limited to a single case. Secondly, as we are totally dependent upon the respondent's responses and available information at GE website this limits our mappings and therefore resultant conclusion. Provided information is transparent and relatively comprehensive, coming follow up interviews with other department's personals and inclusion of the GEs may further enrich this information. Finally, presentation of any framework presents its own limitation and many other factors must be taken into consideration such as environmental variable while adopting.

Further future works includes subsequent case studies from GEs to overcome the limitations of presented study and get deeper understanding how ITG is applied by other GEs for EG purpose. It would also be interesting to undertake additional research in GEs in order to develop further understanding about how objectives, goals, power, legitimacy and urgency of involved GEs play a role in ITG practices.

CONCLUSION

An effective implementation of ITG is an important element for the development of successful EG. This research explored ITG elements within the context of EG and proposed an ITG framework for EG. The case study showed all necessary ingredients of ITG. Findings from the case study showed that there has been moderate adoption of ITG frameworks for EG developmental phases. Further research will be required in order to assess the implementation of ITG elements in EG in GEs. More research is needed to assess the robustness and applicability of ITG frameworks in large governmental organizations in different regions and countries. Hence, such needed research could investigate the nature of ITG relationship and their impact on EG development and how they are implemented in practice. As it has been shown in this research that effective ITG could lead to many benefits and to successful EG development.

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