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CRITICAL SUCCESS FACTORS FRAMEWORK FOR IMPLEMENTING EFFECTIVE IT GOVERNANCE IN PUBLIC SECTOR ORGANIZATIONS IN A DEVELOPING COUNTRY

Edephonce Ngemera Nfuka
Stockholm University, nfuka@dsv.su.se

Lazar Rusu
Stockholm University, lrusu@dsv.su.se

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Edephonce Ngemera Nfuka
Stockholm University
nfuka@dsv.su.se

Lazar Rusu
Stockholm University
lrusu@dsv.su.se

ABSTRACT

Today in many public sector organizations, the use of IT has become important in enabling public services delivery. This has caused a critical dependency on IT that call a specific focus on effective IT governance. Accordingly, the success factors for governance over IT resources must be established and adhered to if an organization has to increase the contribution of IT in achieving its objectives. Several researches have been done on such IT governance effectiveness and necessary success factors but with no focus on such organizations in a developing country like Tanzania (environment). Several frameworks for IT governance exist with various approaches. These include control frameworks such as COBIT, and IT service management such as ITIL. However none of these frameworks has looked at such improvement to effective IT governance from a high level and holistic view to Critical Success Factors (CSFs). Such view to CSFs on what few aspects to concentrate on for effective IT governance is paramount in such an environment, which on the one hand is characterized by higher IT resources, knowledge, and culture constraints and on the other hand by the increase of IT investment and applications. In this paper, based on design science research we have specifically addressed this gap by developing a CSFs framework for implementing effective IT governance in this environment (CEITG framework). It was mainly achieved using the four previous studies in this environment as a basis, opinions of 43 IT/business people from 25 organizations and 6 industry/academic experts and a case study in one of these organizations during its development and evaluation. This led to a high level and holistic view framework with concrete practices for effective IT governance implementation in this environment.

Keywords

IT governance, Critical success factors, Framework, Public sector organizations, Developing country, Tanzania.

INTRODUCTION

Today in many public sector organizations, the use of IT has become important in enabling public service delivery (Ali & Green, 2007; UN, 2010). This has caused a critical dependency on IT, which in today's economic and administrative world that deals with government service delivery, involves a complex mix of political, organizational, technical and cultural concerns (Sethibe et al., 2007). This in turn calls for a specific focus on effective IT governance or IT governance effectiveness, which is an actively designed set of IT governance mechanisms that encourage behaviour consistent with the organization's mission, strategy and culture (Weill & Ross, 2004).

While there are various IT governance definitions (Simonsson & Johnson, 2005), one of the most prevalent is "an integral part of enterprise governance, which has potential to provide mechanisms for leadership and organizational structures and processes that ensure the organization's IT sustains and extends the organization's strategies and objectives" (ITGI, 2003). A focus on its effectiveness lies in the fact that most significant IT issues, currently and in the future are not technology-related, but governance-related (Guldentops et al., 2002). For example, Weill & Ross (2004) showed at least a 20% better return on IT investment when effective IT governance is in place. Thus, IT governance-related success factors must be established and adhered to in order to do away with inadequate governance effectiveness that has negative consequences for the IT contribution to public service delivery.

Several studies have looked at such problems of inadequate governance effectiveness (Ali & Green, 2007; Weill & Ross, 2004) and the necessary success factors (Weill, 2004; Tan et al., 2009). However none of these studies has been pursued for *such public sector organizations within the context of a developing country like Tanzania* (*this environment)*. According to the CIA (2010) and UNDP (2010) such a country has a low degree of industrialization and standard of living (Imran & Gregor, 2007). For example, while it's gross domestic product (GDP) per capita was US$1,300 and human development index 0.398, in developed countries it was mostly above US$30,000 and 0.8 respectively.

Increased governance concerns and their consequences in this environment are due to unmatched value from IT investment. This is for existence due to fragmented IT initiatives leading to duplication of efforts and resources in establishing and sustaining them (Bakari, 2007; Ndou, 2004). For example the Tanzanian government's weakness in streamlining some IT applications and infrastructure cost US$200 million and caused duplication of work (Maimu, 2006).

Similarly the concerns are due to on-going IT investment following increased demand for a responsive public sector and expectation of its contribution. For example the Public Sector Reform Programme (PSRP) hire marked investment in IT implementation estimated at US$16 million (PO-PSM, 2010) and the national ID project vital for e-government services provision at about US $176 millions (Maimu, 2010). This also applies to the need for a guide to the strategic integration of IT into Tanzania's poverty reduction and economic growth strategy in which most development efforts are coordinated (Mutagahywa et al., 2007). In addition the concerns are amplified by constraints on IT resources, knowledge, and culture, for example IT infrastructure availability, awareness of IT potential and the culture to embrace optimal IT use. This demands a focused approach, for example, on resource prioritization and optimization, mindset change and value of IT assurance (Nfuka et al., 2009) implying focused best practices to manage such situations cost-effectively.

Several standards and frameworks exist as best practices for managing various aspects. This encompasses policies, procedures and structures designed to provide reasonable assurance that IT delivers value to business (ITGI, 2003). These best practices include Control Objectives for Information and related Technology (COBIT) and Val-IT for IT governance, IT Infrastructure Library (ITIL) for IT service management and ISO 38500 for corporate governance of IT (OGC, 2010; ISO, 2008; ITGI & PwC, 2008). However, the broader and most internationally used best practices in IT governance are the COBIT framework and ITIL (ITGI & PwC, 2008). COBIT has 34 processes in four domains spread from planning and organization to monitoring and evaluation with 318 control objectives, and ITIL has 27 processes in five domains from service strategy to continual service improvement with numeracy set of general best practices.

These frameworks are also vital to such a country in which its public sector has experienced dramatic changes in the demand for and use of IT in public service delivery improvement (Bakari, 2007; Mutagahywa et al., 2007; Nfuka et. al, 2009; Tz-IT policy, 2003). However such frameworks are too complex and generic for all organizations and situations and therefore a lot of effort in customizing to a specific organization (Ribbers et al, 2002). Given the immature state of IT governance and constraints on IT resources, knowledge and culture in this environment (Nfuka et al., 2009; Rusu & Paul Tenga, 2010) a high level framework based on Critical Success Factors (CSFs) that are limited to a number of areas in which satisfactory results ensure success in an organization (Rockart & Van Bullen, 1986), can provide a more focused approach. Such CSFs are widely researched (Tan et al., 2009) and applied in many organizations in different perspectives; from a single project to the whole organization's strategic direction (Esteves, 2004). However in the area of IT governance, and considering CSFs as essential elements to achieve its effective implementation, few CSF studies have been undertaken, while IT governance has become critical in most organizations today (Sethibe et al., 2007).

Recently, based on five IT governance focus areas (Buckby et al., 2008; ITGI, 2003; Wilkin & Chenhall, 2010) and five organizations from this environment, an exploratory study to address part of such a gap has been pursued (Nfuka & Rusu, 2010b). It explored existing IT governance related CSFs (Teo & Ang, 1999; Guldentops, 2004; Weill, 2004; Tan et al., 2009) and specifically identified eleven CSFs for effective IT governance in this environment. Moreover subsequent quantitative based study indicated a significant positive correlated effect of these 11 CSFs on IT governance performance and, as a result, CSFs for effective IT governance model in the environment was suggested (Nfuka & Rusu, 2011). Given the importance of this model, a framework to address its implementation in such an environment that needed to concentrate on the most important aspects for success, was necessary thus the motivation of the current paper.

In this paper, based on design science research we have specifically addressed such a gap by developing a CSFs framework for implementing effective IT governance in this environment (abbreviated as CEITG framework). This has been achieved in two main phases; development and evaluation. The development phase was based on four previous studies in this environment, further literature review and opinions from 43 IT/business people in 25 organizations and 6 experts. The evaluation phase was based on a case study organization in which 24, mainly IT/business management personnel were involved. The remainder of the paper is organized as follows: section 2 covers research methodology and process followed by CEITG framework in section 3 and finally the concluding remarks in section 4.

RESEARCH METHODOLOGY AND PROCESS

This study that took place from June 2010 to February 2011 its objective was to develop CEITG framework. This took into account that a framework is an outline of interlinked items which supports a particular approach and serves as a guide to a specific objective (Business dictionary, 2010). It also took into account that a framework can be based on theoretical and/or practical experiences that finally yield recommendations to help practitioners and academicians alike in their work (Peffers *et al.*, 2005). Given the nature of the problem, context and objective we used a design science research that creates and evaluates IT artifacts intended to solve identified organizational problems (Hevner et al., 2004).

Considering that the objective of a solution relates to a new artifact intention (Peffers et al., 2008), as an artifact the CEITG framework objective is to implement effective IT governance in the public sector in a developing country like Tanzania. With this framework it should be possible to plan, apply and continually improve IT governance implementation in these organizations. This is achieved by developing it with a high level and CSFs holistic view in this case in terms of the whole five IT governance focus areas indicated above. The solution informs these organizations on how to address the earlier identified and confirmed 11 CSFs (Nfuka & Rusu, 2011) by answering the question "how can this environment implement effective IT governance based on these 11 CSFs within five IT governance focus areas?"

Developing the Framework According to Design Science Research

The development of this framework took into consideration design science research and its interplay with behaviour science (Hevner et al., 2004; Peffers et al., 2008). This was motivated by the aspiration to implement effective IT governance in the studied environment by means of innovative artifact in this case a method. We developed such a method in the form of a framework that provides practical knowledge useful for improving governance in this environment. This practical knowledge can also be referred to as a design theory (Peffers et al., 2005).

Similar to design theory development which proceeds as a cycle of propose/refine and test design theory (Simon, 1996), design science research proceeds as a cycle of two main phases: build and evaluate (Hevner *et al.*, 2004). This can be done iteratively in which related artifact is built to innovatively address the problem identified and then evaluated against the utility it provides (Hevner et al., 2004). The development and evaluation of the CEITG framework is based on such background and also on fact that artifacts are not only computers and computer systems, but also IT use and management conceived as a complex and changing combination of people and technology (Dahlbom, 1996; Boland, 2002).

The development was accomplished in two iterations (Figure 1). Iteration 1 was synthesis of related results from four previous studies in this environment (Nfuka et al., 2009; Nfuka & Rusu, 2010a; Nfuka & Rusu, 2010b; Nfuka & Rusu; 2011) and extension with related literature review. Iteration 2 was the framework enhancement based on the opinions from 43 personnel in 25 organizations, mainly some heads of IT and business units that attended training on strategic management of IT in the public sector in Tanzania, July/August, 2010. This also applies to 6 industry/academic experts.

The evaluation was accomplished in iteration 3 (Figure 2). This was done through a case study in a real business environment (Hervner et al., 2004), in this case the Tanzania Revenue Authority.

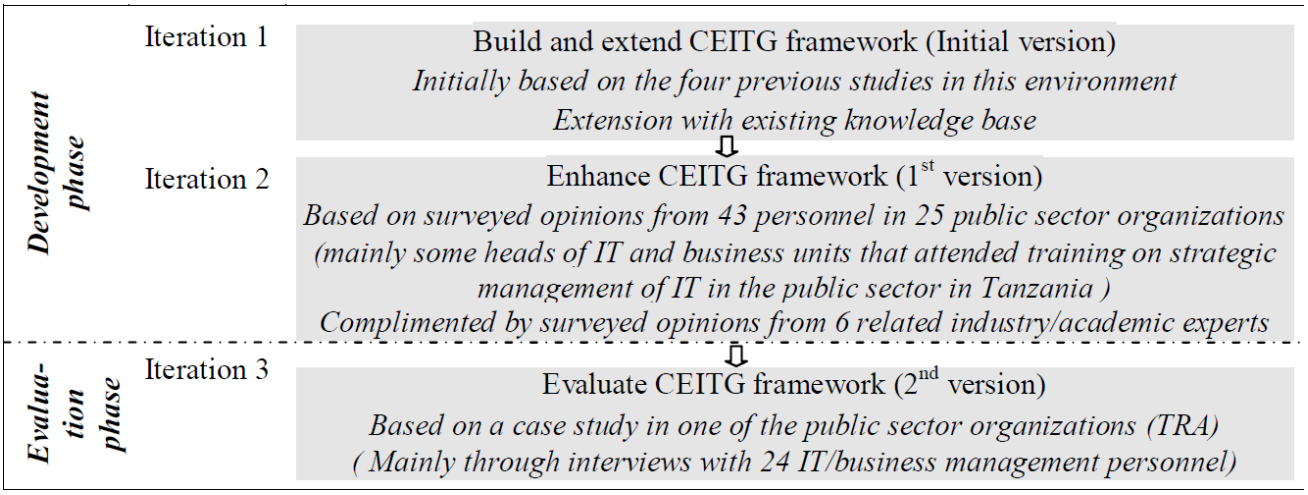

Figure 1. CEITG Framework Development and Evaluation Process

Development Phase

This phase consisted of iteration 1 and 2 in which initial CEITG framework was built, extended with knowledge base and finally enhanced with empirical data (Figure 1). It ended up with 1st version of CEITG framework (Figure 2).

Building the Initial CEITG Framework

In this initial sub-phase of development, the initial CEITG framework was built mainly based on the already indicated four previous studies. As part of these studies the state of IT governance practices in general (Nfuka et al., 2009) and the maturity of IT processes in particular (Nfuka, 2010a) were revealed. Subsequently 11 CSFs for effective IT governance were identified (Nfuka & Rusu, 2010b). Furthermore a correlated effect between these CSFs and IT governance performance was statistically confirmed thus suggesting a model of CSFs for effective IT governance in this environment (Nfuka & Rusu, 2011). This model was the base for an initial CEITG framework in which the CSFs were the main component. The five IT governance focus areas (ITGI, 2003) in which these CSFs are based were found to be another component. This also applies to the IT governance performance outcome in the model that consists of four elements with a function of assessing the success and subsequently triggering the business oriented improvement.

Given that the model in which the initial framework was based only had contextual elements (Nfuka & Rusu, 2011) found in the process of identifying CSFs in this environment and the high level nature of the proposed framework, the activities for each guiding CSF were carefully thought through. This was in order to ensure that each guiding CSF has relevant actions to be implemented and to meet the claimed artifact objective. Therefore as part of the artifact design concentration was on synthesizing and proposing these activities. This was done based on the already indicated four previous studies in this environment specifically looking at concerns and contextual elements, and measures used in the construct to test correlated effect between CSFs and IT governance performance. This process resulted in the initial 39 proposed activities, two to six in each guiding CSF, as indicated by last column in Appendix 1.

Given the concern found in this environment of relegating IT issues, including its governance, to IT people rather than treating it as an IT and business concern (Bakari, 2007; Nfuka et al., 2009), the initial CEITG framework also considered a role for each activity as another component. According to role theory, it is a set of rights, duties, norms and behavior that a person, in this case as a manager, has to face and fulfill (Hindin, 2007). Special emphasis was placed on involving both IT/business people to assure ownership and promised business contribution from IT amidst IT resources constraints.

Given the latter, high level nature of the proposed framework and management structures in place, Chief executive officer (CEO), Management team (MT), Head of IT (HIT) mostly referred as CIO in the literature (Lawry et al., 2007) and Head of the business department (HBD) were considered roles. Such positions have different names in studied organizations - for example the CEO in the ministry is called the Permanent secretary while in some agencies and departments Director general. This also applies to HIT with varied names such as Director, Head or Manager of IT and HBD with names such as Director, Head or Commissioner of a business department (PO-PSM, 2010). Given the nature of an activity, the corresponding guiding CSF and four previous studies the role for each activity was established.

Also due to concerns related to the operating culture and the state of IT in these organizations and country as whole (Mutagahywa et al., 2007*;* Nfuka, 2009), the environment was considered as a component. According to Schoderbek (1990), apart from the fact that it lies outside the system's control it also determines some aspects of the system's performance - in this case the success of the CEITG framework. Due to its nature such aspects are the mostly used IT governance best practices like COBIT and ITIL (ITGI, 2008; Larsen et al., 2006) and public infrastructure dealing with national level IT related policies, infrastructure and regulations (TzITPolicy, 2003). A still more important aspect is the organization in which it will be implemented and envisaged to fit, coexist and fulfill the intended objective. While things may differ depending on the nature and type of the services provided (PO-PSM, 2010), generally the framework is expected to interact and align with organization's goals, strategies, structures and systems for sustainable success.

Extend Initial CEITG Framework with Knowledge Base

Considering that design science refers to a broad knowledge base of theories, models and methods that provide a basis for the design process (Hevner et al., 2004), the initial framework was further extended taking it into account. IT governance related frameworks and standards (e.g. COBIT, Val IT and ISO 38500 for IT governance, and ITIL and ISO 20000 for IT service management) were first analyzed since organizations consider them when embarking into IT governance implementation (Fink & Ploder, 2008; ITGI & PwC, 2008; ITGI, 2007; ISO, 2008; Larsen et al., 2006).

Also a literature review was conducted to identify other existing artifacts and theories to enhance the framework. As an extension to the literature review we did in a previous study (Nfuka & Rusu, 2010b), we accessed several journals. This included the Association of Information Systems (AIS) journals, complemented by MIS journals ranking in which we accessed 35 relevant journals (AIS, 2010). Furthermore, we looked at conferences with a specific mini-track of IT governance, such as the Hawaii International Conference on System Sciences, the American Conference of Information Systems and European &Australian Conferences on Information systems. Parallel to these efforts Google scholar was used with the search words *Information Technology governance* in a combination with *critical success factors* and *framework.*

We noted that none of them had the same approach as ours in terms of looking at the improvement from a high level and holistic view to CSFs and also considering the public sector in a developing country like Tanzania. This reinforced our proposition that currently there is no such framework since the best practices and 15 papers that we found had different points of view or dealt with only some aspects of the study. However we noted that some aspects can be used to improve the CEITG framework e.g. IT resources that are important in implementing effective IT governance, as a greater contribution of IT to business can be obtained when such resources are leveraged (ITGI, 2007; Peterson, 2004). This is even more important in the environment we studied given the noted IT resources constraints (Nfuka et al., 2009) thus it was incorporated as a component that categorizes IT resources being transformed to meet the framework objective. The categories we adopted are applications which are automated user systems and manual procedures that process the information, and information which is the data, in all their forms, input, processed and output from the information systems used by business. Others are the infrastructure i.e. the technology and facilities that enable applications, and the people to develop and manage information systems and services (Buckby et al., 2008; ITGI, 2007).

Similarly some activities were added e.g. *(5.1)* Define and align IT goals to business goals (ITGI, 2007; Van Grembergen & De Haes, 2009) - important in this environment for providing a focus on what IT can contribute to business. Other included *(8.4)* Provide efficient IT services in and beyond the organization (Peterson, 2004; Ribbers et al., 2002; Tan et al., 2009) given increased outsourcing and required service quality criteria for both internal and external user satisfaction.

Enhancing the CEITG Framework

At this stage the initial framework was enhanced by input of 43 mainly IT and business management personnel from 25 public sector organizations and 6 industry/academic experts (Table 1). In both cases they were asked general framework enhancement and specifically on new or improved activities and the appropriateness of assigned roles and IT resources. In line with content analysis approach (Neuendorf, 2002) their inputs were analyzed, categorized (Table 1) and incorporated into the framework (Figure 2). For example from IT/business respondents it was suggested that *Set and actively monitor targets and performance measures* should include both aspects of IT per se and business related

measures. This led to *(11.1)* Set and actively monitor IT and business oriented performance measures. This also applied to the industry/academic experts, e.g. one indicated that *"having in place business applications that talk together seamlessly can facilitate cost-effectiveness and information sharing in and across such widespread organizations, however optimized and harmonized investment and procurement is vital for this to happen"*. This and the fact that operational cost was not clearly shown in previous stage *led* to *(7.2)* Institute optimized IT investment, procurement and operational cost. Altogether these improvements resulted in enhanced CEITG framework (Figure 2).

Type	Profile	Summarized and incorporated suggestions in CEITG framework
IT/Business management personnel	IT management (22) ○ Director/Assistant Directors IT (6) ○ IT managers/Head of IT Units (11) ○ Senior IT officers, administrators & Analysts (5) Business management (21) ○ Directors/Assistant Directors (9) ○ Managers/Head of units (7) ○ Senior officers (5)	Activities ○ Sensitize IT leadership on business imperatives improved to *(1.2) Sensitize IT leadership on business imperatives and viable IT intervention* ○ Integrate IT effectively in public sector reform improved to *(5.5) Integrate IT effectively in related public sector reforms* due to existence of several public sector related reforms in central and local government in which IT is a component. ○ Provide efficient IT services in and beyond organization improved to *(8.4) Benchmark and provide efficient IT services in and beyond organization.* This is due to service quality criteria following increased own and outsourced services. ○ Define *and actively manage services offered by third parties* added due to many IT services having elements of third party to manage. ○ Establish and motivate IT innovation practices improved to *(10.3) establish & motivate aligned IT innovation practices* to emphasize aligning them to business goal/imperatives Other comments ○ Involve CEO, HBD and MT as responsible for some activities rather than HIT alone to avoid IT to be treated as a technical people issue e.g. in IT projects committees, enforcement of policies, and communication of IT strategies to all levels. ○ Useful for sustainable IT contribution to public service delivery improvement
Industry/academic experts	Industry ○ Director - IT governance centre ltd ○ Head IT governance Initiatives-Bank of Tanzania ○ IBM business development head & former e-gov. advisor ○ Director, Informatics consulting ltd & former management of IT related consultancy at PwC-Tanzania ○ Director, Data vision Academic ○ Director IT services and senior e-government researcher –IFM	Activities ○ Establish aligned IT strategies and operations to be *(5.2) Establish business-aligned IT strategies, resources and operations* for aligning with necessary resources. ○ Demonstrate viable IT value proposition for senior management and politicians support to be *(2.2) Demonstrate viable business value proposition from IT for senior management, board and politicians support* as board is top organ in some studied organizations that directs, oversees and monitors investment & operations. ○ Provide & manage IT facilities rationally to be *(8.1) Provide & leverage IT facilities rationally* for a balance to provide them & widespread IT use. Manage to be in a separate activity due to its different requirements including the role to ensure it. ○ Standardize and share IT infrastructure effectively to be *(8.2) Standardize, share and manage IT infrastructure effectively* due to the latter reason. ○ Remove Institute IT project management methods as it can be one of the essential IT processes in *(7.1) Establish essential IT processes and governance framework* Roles/IT Resources ○ Change role to CEO for Institute clear & adequate IT roles & responsibilities; Develop shared IT/business goals & imperatives understanding among key stakeholders; Institute shared IT/business goals & imperatives understanding among IT & business personnel Other comments ○ Useful for implementing, monitoring & evaluating IT governance implementations ○ Useful tool for awareness, recruitment, and updating policies and strategies ○ Linkage to *e-government strategies* as part of a connection to *Environment* is vital

Table 1. Respondents' Profile and Summarized Suggestions for CEITG Framework Improvement

Evaluation Phase

As March & Smith (1995) and Hevner et al. (2004) indicated the developed artifact should be evaluated against the utility they provide in the business environment through analytical, case study, experimental, field study or simulation approaches. Given the nature of the problem and context CEITG framework (Figure 2) evaluation based on a case study in one of the public sector organizations, the Tanzania Revenue Authority (TRA). The TRA, which is responsible for tax administration with a current annual operating budget of about US$ 80m out of which US$ 2.4m is for IT and 3,500 employees out of whom 45 are IT personnel, was chosen for a number of reasons. One was the considerable and relatively higher IT enabled business applications and supporting infrastructure in place across its offices in the country. An example of the applications included the Integrated Tax Administration System (ITAX), the Central Motor Vehicle Registration System (CMVRs), the TRA Monitoring and Evaluation Database (TRAMED), the Case Inventory Management Information System (CIMIS) and the Automated Systems for Customs Data (ASYCUDA) (Nfuka et al., 2009; TRA, 2010). Also the number of experienced IT/business management personnel that manage such highly demanded applications and enabling infrastructure were considered to be a valuable input in evaluating such a framework.

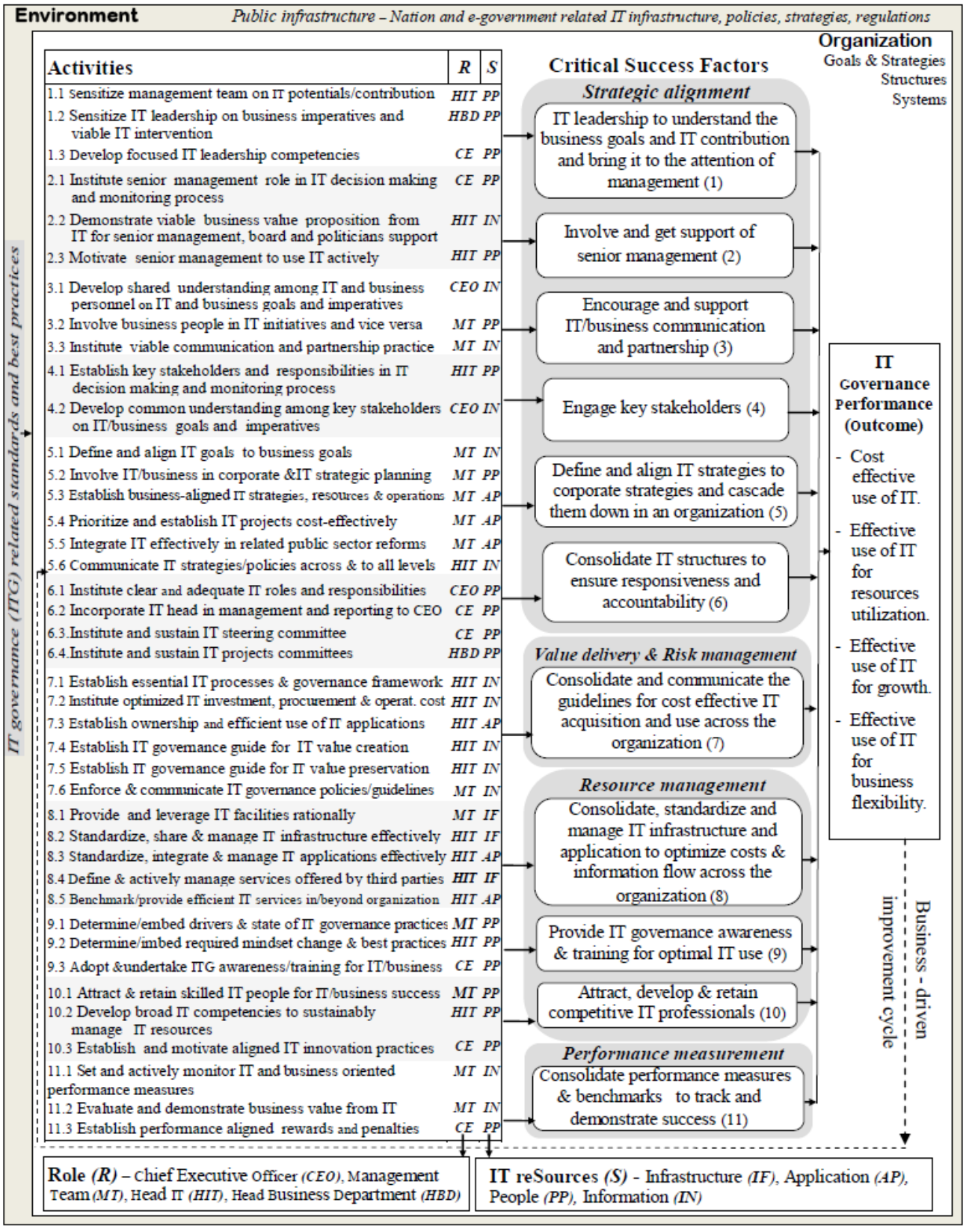

Figure 2. Enhanced CEITG Framework

The case study was carried out based on semi-structured interviews (Myers, 1997; Yin, 2003) to allow both questionnaire and interviews where a brief on the framework was provided to the respondent, who was then given time to practice it and answer set questions in form of survey and interview. In this way we involved 24 respondents (Table 2). Also related documents like corporate/IT strategies and progress reports were collected to triangulate with respondents' views.

- IT management (13)
  - Director/Deputy director IT (2)
  - IT managers - Systems operations/prod.; Systems development; Infrastructure/communication; Systems maintenance (4)
  - Senior/Technical and business analysts - Systems development, operations, production and office productivity (7)
- Business management (11)
  - Deputy commissioners - Technical services; Tax investigation; and Enterprise wide risk management (3)
  - Managers - Planning and modernization; Customs automated systems; Technical services; Dataware house project (4)
  - Business analysts/developer - Planning and modernization and Research and policy (4)

Table 2. Respondents' Profile in Case Study for Evaluating CEITG Framework

Given the nature of the framework structure and the objective, the protocol for the evaluation was mainly based on measuring its effectiveness (Clementi & Carvalho, 2006; Walford, 1990). Such measures included *(1) formal description* to meet the need for no ambiguity, *(2)* definable activities through *understandability* of the framework, *(3) completeness* of the framework to ensure no additional activities to achieve the objective, and *(4) implementable action* for activities to be capable of implementation. These evaluation criteria were complemented by *(5)* usability through measuring *ease of use* and *(6)* fit by measuring the *usefulness* of the framework in the organization (Hevner *et al.*, 2004). Each of these were quantitatively measured on a level of how they are fulfilled by the CEITG framework in a five-point Likert scale i.e.*'1'Strongly disagree, '2'Disagree, '3'Undecided, '4'Agree and '5'Strongly agree* (Kothari, 2004).

Additionally, qualitative opinions were requested on what to improve further in each of them to fulfill the framework objective. Also general information on the respondent's profile, like IT governance familiarity and experience in use and managing IT was inquired of, and which experience in the use of IT indicated *above 3 years* and managing IT mostly *beyond 5 years*. In IT governance familiarity majority indicated *to some extent* and also several *to great extent*.

Generally the results showed the CEITG framework to be useful (Figure 3). This also applies to qualitative comments. For example, one of the Deputy Commissioners said *"useful and due to its holistic view from strategies to evaluation will improve business value from IT even with existing IT resources. Also it will enable systems to talk thus reducing the cost of incompatibility while increasing efficiency"*. This compliments an observed concern in their corporate plan that *"challenges they face include under-utilisation of the available IT resources and poor state of the telecommunication infrastructure needed to link all TRA operational offices country-wide in order to facilitate e-government"* (TRA, 2008).

The result also indicated difficulties in ease of use (Figure 3). This also applies to qualitative comments. For example one of the Managers said *"The framework is very useful but should be simplified such that even non-IT management personnel can easily grasp e.g. by reducing many available arrows"*. More specifically, under completeness of the framework interview questions included the opinions on activities that can be added or improved to meet the framework objective. This also applies to assigned roles and IT resource category for each activity. Most notable was change management as an activity on its own e.g. the coordinator of one of the projects said *"change management is vital here to embrace and sustain the culture for optimal use and demonstrate-able business value from IT"*. In line with Neuendorf (2002) opinions and respective improvements were analyzed (Table 3) and incorporated in CEITG framework (Figure 4).

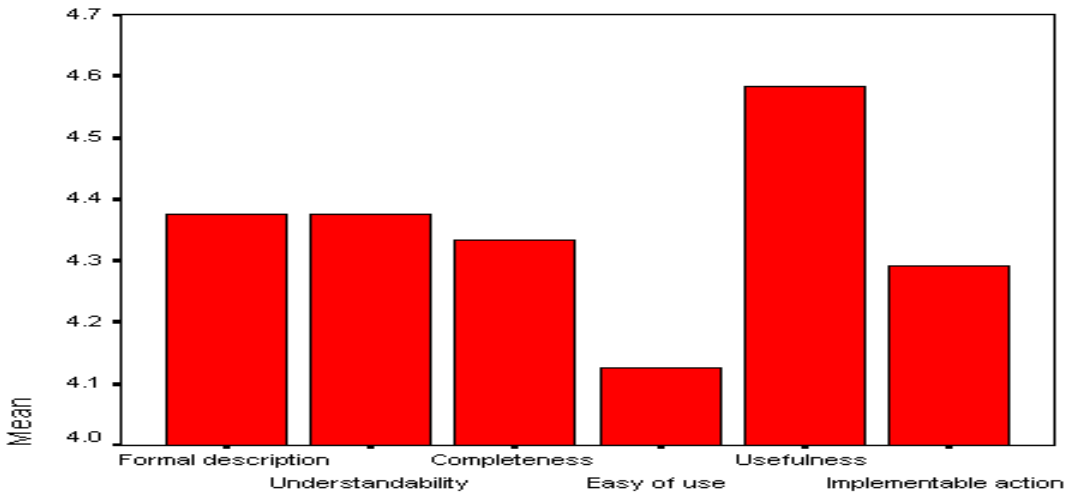

Figure 3. Part of Results for CEITG Framework Evaluation

Items	Interviewees Opinions	Improvement in CEITG Framework
Formal description	Most of them indicated framework description to be fine however; • Description of arrows between components needed or avoid them • More elaborate guideline needed to support the framework	• Framework simplified taking out arrows • Separate framework narrative improved (not included due to space)
Understandability	Several showed framework to be understandable however; • Many arrows between components are not easy to understand • Further description of some key terms required	• As above plus all key terms are clearly indicated in the framework and defined in supporting narrative
Completeness of the framework *(Including at level of activities etc.)*	Majority showed to be complete as cover most critical areas however; • Change management vital in such environment, not shown on its own • Active follow-up/action in steering/project committees were required • Harmonized IT projects in and across relevant organizations was required for optimal use of IT resources & efficient flow of information • IT services provided by third party given increased number • Describe IT governance performance outcome as related to IT purpose • Improve roles e.g. 5.1/5.3 to HIT for increasing accountability and 5.2/7.6 to CEO for increasing enforcement and joint participation	• Added *(7.5) Determine and institute change management* (Figure 6) • Added *actively* in 6.3 & 6.4 and *harmonize* in 5.4 (Figure 6) • *IT governance performance outcome items* indicated clearly (in CEITG framework narrative) • Roles: 5.1/5.3 changed to HIT and 5.2/7.6 changed to CEO (Figure 6)
Easy of use of the framework	Several showed easy to use it but some didn't especially from business; • More simplifications is required to make it reader friendly e.g. CSF on left and activities on right • Improve on presentation for non-IT management personnel to grasp as such a framework is useful for both IT and business personnel	• Framework simplified e.g. breakdown from right to left *(focus areas to activities)* • Also IT governance performance outcome moved to activities as *(11.4) Assess IT governance performance & continually improve* through cost effective use of IT and effective use of IT for resources utilization, growth & business flexibility
Usefulness of the framework	Most respondents indicated to be very useful as it provides: • High level benchmark to implement, monitor & evaluate IT governance initiatives as well as behaviour change in use and management of IT • Focus for necessary and harmonized IT initiatives and best practices for more service delivery improvement and cost reduction in an organization	• Indicated to be useful for intended objective thus motivating further required improvement for easy of use and others above
Implementable actions	Majority indicated to be implementable and achievable however; • Cost and skills implications are constraints to be addressed • Senior management support & IT/business commitment critical • Some places have no IT facilities while ones available not fully utilized • Some of activities like in attract & retain are difficulty in public sector	Emphasis in activities & narrative guides on; • Senior management support/awareness • Commitment of IT/business management • Provide and leverage IT facilities • Motivation other than salaries

Table 3. Summarized Suggestions from Evaluation for CEITG Framework Improvement

CEITG FRAMEWORK

The proposed CSFs framework for implementing effective IT governance in public sector organizations in a developing country like Tanzania (CEITG framework) different to existing ones adopts a high level and holistic view to CSFs for effective IT governance implementation.

Objective of the Framework

Considering that the objective of a solution relates to a new artifact intention (Peffers et al., 2008), the CEITG framework objective is to implement effective IT governance in these organizations. With this framework IT and business management personnel should be able to plan, apply and continually improve IT governance implementation.

Structure of the CEITG Framework

It consists of eleven CSFs along five IT governance focus areas and the forty two activities necessary for implementing effective IT governance in these organizations. It also consists of the roles required and the type of IT resource being transformed for each activity to attain the envisaged improvement. Given the need to fit within an environment for success there is a linkage to it (Schoderbek, 1990) consisting of IT governance related best practices, public infrastructure and organization itself in which the framework will be implemented. Altogether provide a guide advocating that the eleven CSFs related improvement is required in five IT governance focus areas as a whole for effective IT governance implementation in these organizations (Figure 4).

Figure 4. Framework of CSFs for Implementing Effective IT Governance in Public Sector Organizations in a Developing Country like Tanzania (CEITG Framework)

CONCLUDING REMARKS

In this research work a CSFs framework for implementing effective IT governance in public sector organizations in a developing country like Tanzania (CEITG framework) were developed. This framework in relatively lower IT resources, knowledge and culture environment comprised components that were elicited mainly based on the design science research approach. These components were found to be the eleven guiding CSFs and five IT governance focus areas along which CSFs were identified and confirmed. As a component also was the activity to ensure solution for specified problems in this case on fact that there are activities to concentrate on for each CSF to contribute significantly to effective IT governance implementation. This also applies to required roles and the kind of IT resources transformed to

accomplish these activities together with a link to the environment concerned, in this case IT governance related best practices, public infrastructure and the organization itself in which the framework is to be implemented.

In contrast to existing IT governance frameworks, we found the CEITG framework to be a high level and CSFs holistic view based framework that can provide more focus when implementing effective IT governance in such environment with scarce IT resources and a need to use them optimally. Aligned to the existing IT governance related best practices the findings can be used to improve available approaches to IT governance implementation. Specifically it will enable both IT & business management personnel to plan, apply and continually improve IT governance implementation in these public sector organizations from a developing country like Tanzania. It will also enable them to focus on practices that have a higher impact on effective IT governance implementation that could ultimately improve public service delivery.

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APENDICES

Appendix 1: Deriving CEITG Activities from the Four Previous Studies in the Environment

Concerns/contextual elements (Four previous Studies)	Measurement items in previous study (Nfuka & Rusu, 2011)	Proposed activities for CEITG framework
IT Governance focus area: Strategic alignment		
CSF1: IT leadership to understand the business goals and IT contribution and bring it to the attention of management		
IT leadership incompetency and increasing heads IT position. IT leadership lower understanding of business goals & imperatives. Top/business management lower understanding of IT potentials.	Effective IT leadership competencies IT leadership understanding of business goals/imperatives & actionable IT intervention Management team understanding of IT opportunities and contribution	• Develop focused IT leadership competencies • Sensitize IT leadership on business imperatives • Sensitize management team on IT potential/contribution
CSF2: Involve and get support of senior management		
Low IT political support and committed top management; Users tend to conform to their bosses expectations; Lower IT related resource prioritization.	Senior management and high level political support to strategic use of IT. IT-related resources prioritization	• Institute senior management role in IT decision making and monitoring process • Demonstrate viable IT value proposition for senior management and politicians support
Action oriented involvement	Senior management action-oriented involvement	• Motivate senior management to use IT actively
CSF3: Encourage and support IT/business communication and partnership		
Poor IT/business communication. Lower understanding of IT opportunities &business imperatives by business &IT people respectively. Immature IT/business cooperation but vital due to in & cross-agency expected common achievement.	Shared understanding of business/IT goals, strategies and imperatives. IT governance mechanisms transparency Business involvement in IT initiatives and vice versa Regular communication between business/ IT Formally/informally business/IT cooperation	• Develop shared understanding among IT and business personnel on IT/business goals and imperatives • Involve business in IT initiatives and vice versa • Institute viable communication and partnership practice
CSF4: Engage key stakeholders		
Stakeholders beyond IT & business units as these organizations work in collaboration in several services. Require broader view of needs & solution vital for shared services, integrated information, interoperable e-gov. initiatives & widely use of IT .	Building collaborative relationships with key stakeholders Creating shared understanding among key stakeholders on common agenda Stakeholders actively participate in IT planning and implementation of shared resources/services	• Establish key stakeholders and responsibilities in IT decision making and monitoring process • Develop common understanding among key stakeholders on shared IT/business goals and imperatives
CSF5: Define and align IT strategies to corporate strategies and cascade them down in an organization		
In most organizations no clear view of IT to business goals. IT strategic plan are ad-hoc & mostly embedded in corporate strategies by few lines thus no concrete tie on IT & business activities & performance reforms. Inadequate prioritization along with communicating strategies to all levels for a widespread IT use	Alignment of IT/business goals, strategy and operations A well-communicated IT strategy and policy down to all levels of organization Active participation of IT people in corporate strategy and business people in IT strategy planning Aligned IT to performance reforms in public sector	• Align IT strategies and operations • Communicate IT strategies across and down to all levels • Prioritize and establish IT projects cost-effectively • Involve IT/business in corporate and IT strategic planning • Integrate IT effectively in public sector reform
CSF6: Consolidate IT structures to ensure responsiveness and accountability		
Lack of clear & enough roles and responsibilities that promotes ownership, accountability & partnership. Lack of head of IT or not reporting directly to CEO. No IT steering committee & where exist are not optimally exploited. This also applies to project committees though more exist.	A participatory designed & widely communicated IT governance mechanisms on IT structure with a focus in partnership, ownership and accountability Clear/adequate role &responsibilities/categories CIO part of management & reports to CEO Active IT steering committee that oversees Having IT project committee to oversee/ monitor the project activities and outcome	• Institute clear and adequate IT role and responsibilities • Incorporate head of IT in management and reporting to CEO • Institute and sustain IT steering committee • Institute and sustain IT projects committees

Concerns/contextual elements (Four previous Studies)	Measurement items in previous study (Nfuka & Rusu, 2011)	Proposed activities for CEITG framework
IT Governance focus areas: IT Value delivery and Risk management		
CSF7: Consolidate, communicate and enforce policies & guidelines for cost effective IT acquisition and use across the organization		
Ad-hoc IT related practices major weakness being on IT processes Rising IT investment with no matched business value. Inadequate IT policies/guidelines & their enforcement thus hampering widespread ownership,use & benefits. Inadequate controls & sharing of IT resources to create & preserve ITvalue in such widespread organizations.	Provision of effective IT processes guidelines for management & IT staff/users. Enforced IT governance related policies & guidelines Implementing an IT governance and control framework IT project management methodologies Clear IT budget control, reporting & usage	• Establish essential IT processes and governance framework • Establish IT governance guidelines for value creation and preservation • Establish ownership and efficient use of IT applications • Enforce and communicate IT governance guidelines • Institute IT project management methods • Establish IT budget control/usage reports
IT Governance focus area: IT Resource management		
CSF8: Consolidate, standardize & manage IT infrastructure & application to optimize costs & information flow across the organization		
Fragmented IT initiatives & loss of synergies in & across organizations thus non optimized costs, information sharing flow in service delivery. Inadequate IT facilities &management for widely use &enforcement. Ad-hoc delivery/support of IT services	Effective provision and management of IT facilities Standardized and sharable IT infrastructure and applications to optimize costs and information flow Provision of efficient and reliable services to user departments	• Provide and manage IT facilities rationally • Standardize and share IT infrastructure effectively • Standardize, integrate and manage IT applications effectively • Provide efficient IT services
CSF9: Provide IT governance awareness and training for optimal IT use		
Lower IT governance awareness & know-how & culture to embrace optimal use of IT implying a focus on change of mindset & respective best practices in these organizations with multi-levels decision making & operations organs.	Provision of governance of IT training to IT/business management & experts for cost-effective management & optimal use of IT. Provision of governance of IT awareness to users for optimal &cost-effective use of IT. Incorporation of change management in IT governance best practices, awareness &training.	• Determine and imbed drivers and state of IT governance • Determine and imbed required mindset change and best practices • Adopt and undertake IT governance awareness and training for IT/business management personnel
CSF10: Attract, develop and retain competitive IT professionals		
Relatively lower remunerations as compared to private sector thus attracting and retaining becoming a concern. Low recognition of IT personnel as a working capital for successful business strategies/ operations. Low innovations practices/motivation	A focus on attracting & retaining core IT/business competencies related to planning, development and management of IT resources Recognition and encouragement of IT innovations, appropriateness & excellence Skilled IT personnel as working capital of successful IT operations	• Attract and retain skilled IT people for IT/business success • Develop broad competencies to manage IT resources • Establish and motivate IT innovation practices
IT Governance focus area: IT Performance management		
CSF11: Consolidate performance measures and benchmarks to track and demonstrate success		
Weak IT performance measures that cover from business contribution to skills/innovation. Set IT performance measures but not actively followed up. Rare & weak demonstration IT contribution to business. Ad-hoc performance rewards & penalties	Clearly set IT targets in business operations, customer excellence, skills/innovation & corporate contribution Clearly set, active & monitored performance measures for business value from IT Demonstration of IT success/contribution Performance aligned rewards and penalties	• Set and actively monitor targets and performance measures • Evaluate and demonstrate business value from IT • Establish performance aligned rewards and penalties