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# Challenges of CoBIT 5 IT Governance Framework Migration

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## *Abstract*

As information technology (IT) persists as an integral means for achieving success in organisational business processes, IT Governance (ITG) continues to be a top priority too. Current reports show that enterprises continue to suffer financial losses as a result of poor ITG practices. To better govern IT resources, many have tried to address this problem by migrating to the highly recommended IT governance frameworks such as CoBIT 5, unfortunately with little success. This study seeks to explore the barriers to successful migration to CoBIT 5 and identify the key factors that influence effective migration. A survey was conducted and data collected from 84 professionals with sound IT Governance knowledge and experience in the financial services and telecoms industry. The quantitative data was analyzed using statistical methods. Findings suggested that there are four distinct aspects that need to be reconciled; it is only then that before organisations should embark on the migration to CoBIT 5. Results obtained augmented existing literature and also revealed new factors noticeably absent from the ITG literature. The findings provided useful input towards the development of a model to guide migration to CoBIT 5 ITG framework.

## *Keywords*

Challenges, CoBIT 5, Corporate Governance, Effective Migration, IT Governance, IT Governance Frameworks, Key influencing factors

## 1. Introduction

Information technology (IT) is vital to an entity's operational and financial management. (Jiandong & Hongjun, 2010). The effective use of IT, however, depends greatly on good IT Governance (ITG). However, due to poor ITG in organisations, billions of dollars are lost every year (Bowen, Cheung, & Rohde, 2007; Klakegg & Haavaldsen, 2011). Consequently, there are laws and regulatory compliance obligations demanding more effective ITG practices (Valentine & Stewart, 2013; Steenkamp, 2009).

While there is an overwhelming need for organizations to manage better their ITG, little experience-based research has investigated what IT Governance frameworks (ITGFs) work best (Weill & Ross, 2004) and how these ITG structures are implemented (Bowen et al., 2007; De Haes & Van Grembergen, 2009), with even fewer studies being conducted in developing countries. A few existing studies and many anecdotal publications suggest that organizations are experiencing challenges in adopting existing ITG frameworks (e.g.

Information technology infrastructure library (ITIL), Control Objectives for Information and related Technology (CoBIT) and International Standards Organization (ISO) 27000 series).

It is highly recommended today that organizations adopted the latest ITGF – i.e. COBIT 5. It is claimed that earlier frameworks lack a strong governance focus and are more process-oriented (IT Governance Network, 2011). COBIT 5 ensures more effective governance and emphasizes Business-IT alignment by mapping enterprise-wide goals with IT and IT process goals. However, little is still known about this migration to COBIT 5 and questions have been asked regarding when and how organisations should organizations go about such migrations (Van Grembergen & De Haes, 2010). Understanding the enterprise and how it transitions to newer frameworks such as CoBIT 5 would provide insight into what intervention strategies can be employed. The purpose of this paper is to identify the challenges associated with, and the key factors that influence effective migration to COBIT 5 IT governance framework. Accordingly, this paper attempts to answer the questions: (1) What are the significant challenges organizations face when migrating to or implementing the new CoBIT 5 IT Governance framework? (2) What are the key success factors that influence effective migration to these new ITG Frameworks?

This research differentiates itself from previous studies in the ITG field, in that it utilizes findings (factors influencing ITG) from prior studies and adapts them to a new context of migration that has not be widely explored thus creating literature. It further justifies the factors investigated by drawing from Leavitt's model and Van Grembergen's model, producing a conceptual framework to guide the migration to CoBIT 5. This research is expected to help organizations by providing insight on the suitable timing to migrate and how to perform such migrations effectively with the appropriate ITG practices in place.

## 2. Literature review

For the concept of IT governance to be clearly understood, an insight into the principles of Corporate Governance (CG) and its components is vital. CG is the set of procedures, customs, codes, laws, management practices and an institution affecting the way an entity is controlled and managed (Brisebois, Boyd, & Shadid, 2007). It has also been defined as the "processes and structures used to direct and manage the business and affairs of an institution with the objective of ensuring its safety and soundness and enhancing shareholder value" (Maune, 2015). This implies that the governance of IT also forms part of CG (Mohamed, 2012). However, IT governance in many organisations appears to have been relegated to IT managers. Van Grembergen & De Haes (2009), maintain that the creation of business value from IT-enabled investments cannot be realized by IT alone and as such IT governance is the responsibility of business executives. This is supported by Jacobson (2009) and Mohammed & Kaur (2012).

IT Governance is defined in different ways by several schools of thought. The varying definitions of ITG reveal the sharp focus on responsibility lying with the board and executives for the formulation and implementation of an IT strategy to ensure business – IT alignment. They also zoom in on structural, processual and relational elements, decision rights and accountability as emphasized by other previous scholars (Masuku, 2014). These principal foci are an illustration of the current conceptual inclination for ITG to foster strategic alignment and create value through the use of IT-enabled investments to provide for stakeholder gratification (Bannerman, 2009). This study adopts the ITG definition that encompasses all the different aspects captured in part by the different writers. "IT

Governance is a fundamental aspect of enterprise governance, which requires a business-driven approach; it is exercised by the board overseeing the definition and operationalization of processes, structures and relational mechanisms in the organization thus enabling both business and IT people to execute their responsibilities in support of business/IT alignment and the creation of business value from IT- enabled business investments" (Van Grembergen & De Haes, 2010). This supports the notion that ITG is not a standalone, but rather is an integral part of the enterprise strategy that should be driven from a corporate point of view.

ITG provides the structure that links IT processes, resources and information to enterprise strategies and objectives. Organizations with proper ITG structures in place often have higher rates of ROI compared to organizations with poor or no ITG structures (Ali & Green, 2012; Weill & Ross, 2004). Moreover, other studies have shown that organizations with good ITGFs present superior results giving them a competitive edge, which makes implementation of effective ITG crucial for any organization (Lerch Lunardi et al., 2014).

The financial sector took the lead in establishing best practices for governing and controlling IT, closely followed by the telecoms industry (Guldentops, 2004). However, financial disasters and other organizational scandals, which have reflected bad governance, have compelled governments to exact legislation and regulatory compliance to ensure that businesses implement sound ITG practices. The implementation of the Sarbanes-Oxley (SOX) and regulatory compliance such as the KING III report are good examples. The KING III report in particular places the responsibility of ITG directly on an organization's board of directors making sound ITG practices their legal obligation (Institute of Directors in Southern Africa, 2010).

## 2.1 ITG frameworks

SOX requires that organizations implement more appropriate frameworks for ITG (Hardy, 2006). The most common frameworks used are ITIL, ISO and CoBIT frameworks (Jaafar & Jordan, 2011). ITIL defines a guidance of best practice processes. Its primary focus is on IT Service Management (ITSM) i.e. the enhancement of IT service quality (Hill & Turbitt, 2006). ISO entails various smaller frameworks termed the ISO series. These include ISO 27001 and ISO 38500. ISO 27001 concentrates on IT security management (Jaafar & Jordan, 2011) whereas ISO 38500 focuses on management (ISO, 2005). These two ISO standards are directly related to management and use of IT, but none of them provides a complete approach to ITG.

CoBIT is an influential framework in the ITG arena, informing much of how practitioners view, understand and implement ITG within their organizations (De Haes, Van Grembergen, & Debreceny, 2013; Masuku, 2014). This framework positions the ITG objective as the creation of stakeholder value, defined as "realizing benefits at an optimal resource cost while optimizing risk" (ISACA, 2011). CoBIT has evolved from its initial focus on auditing of IT processes to enterprise governance of IT. All the knowledge assets in previous versions of CoBIT are process oriented and function at the operational and managerial level. While these frameworks are distinct in their right, they all lack the governance focus. They concentrate mainly on ITM, are process-inclined and none provide a holistic approach to good ITG practices (ISACA, 2012; Wilkin, Campbell, & Moore, 2013). This is where CoBIT 5 is superior from the rest.

## 2.2 COBIT 5 IT Governance framework

CoBIT 5 is an enterprise level ITGF that applies to business from an executive, strategic, managerial and operational level. "COBIT 5 provides a comprehensive framework that assists enterprises in achieving their objectives for the governance and management of enterprise IT" and "helps enterprises create optimal value from IT by maintaining a balance between realizing benefits and optimizing risk levels and resource use" (ISACA 2012). It unifies other standards, practices, and frameworks and further amalgamates the principles of earlier versions of the CoBIT frameworks into a single ITG framework (De Haes et al., 2013). The components that make up CoBIT 5 are its principles, enablers, architecture and knowledge base. To an extent, many of the principles behind COBIT mirror the principles of ITG as articulated by Weill and Ross (2004); some of the commonalities being the distinction between ITM and ITG, the reliance on CG as the foundation, and the business – IT alignment of strategies. Broadly, the CoBIT 5 framework further identifies "what" to focus on regarding governance as well as "why" to concentrate on these areas (Masuku, 2014). Other frameworks such as ITIL and ISO only identify "how" it will be done on a practical level (Robinson, 2005), which is ITM, not ITG.

## 2.3 Effective ITG framework migration

*Migration* is a term which when loosely defined refers to movement (Webster, 2011). In IT, migration is the process of moving from working in one operating environment to another often perceived as the better environment (Rouse, 2005). In this study, ITGF migration is the movement or transition from informal ITG adoption or transition from an earlier framework to the new CoBIT 5 ITGF. It is also perceived as the implementation of CoBIT 5 ITG framework. The *effectiveness of the mechanisms for the ITGF migration* are seen to influence positively and contribute to the success of the migration to CoBIT 5 (Ferguson, Green, Vaswani, & Wu, 2013).

We adopted Leavitt's (1989) Diamond model of organizational change to examine the nature and conditions for migration. Leavitt predicts that there are four critical factors that need to be reconciled in order to achieve a successful change in an organization. These critical factors are Technology, structures, managerial tasks, and people (Leavitt, 1965). Technology refers to key equipment and processes that enable and support the business functions. However, for the business processes to run effectively there must be appropriate technology. Structures determine the groupings of people, hierarchies and decision structures. Where there are no clearly defined structures there is bound to be confusion in the way business processes are conducted. Tasks are the activities being performed. The tasks to be performed need to be clearly defined and responsible personnel assigned to those tasks. People refer to the workforce, who is undoubtedly the most important element in any change initiative as it highly depends on their willingness, attitude and aptitude. There is need to incorporate training and ensure that the workforce is skilled and qualified to perform the duties or to oversee them.

Consistent with the requirement to reconcile the four factors identified by Leavitt (1989), Van Grembergen (2010), maintains that the migration process should meet the following key baseline requirements i.e. it should be directed by an IT steering committee and a committee to oversee the project. There should be IT leadership and IT budget control and reporting mechanisms. Project governance and management methodologies for guiding the process also need to be in place. In addition, Portfolio management practices need to be exercised and the CIO should report regularly to the CEO/COO during this process. He recommends that this process should adhere to the principles of the CoBIT 5 governance model.

Taking these requirements into consideration, a conceptual framework to guide ITGF migration is proposed below.

## 2.4 The conceptual framework

In this framework, we argue that there are factors which an organisation must reconcile before it may consider migrating. These factors therefore would influence the migration approach adopted. The migration approach will consequently determine the effectiveness of the migration to CoBIT 5.

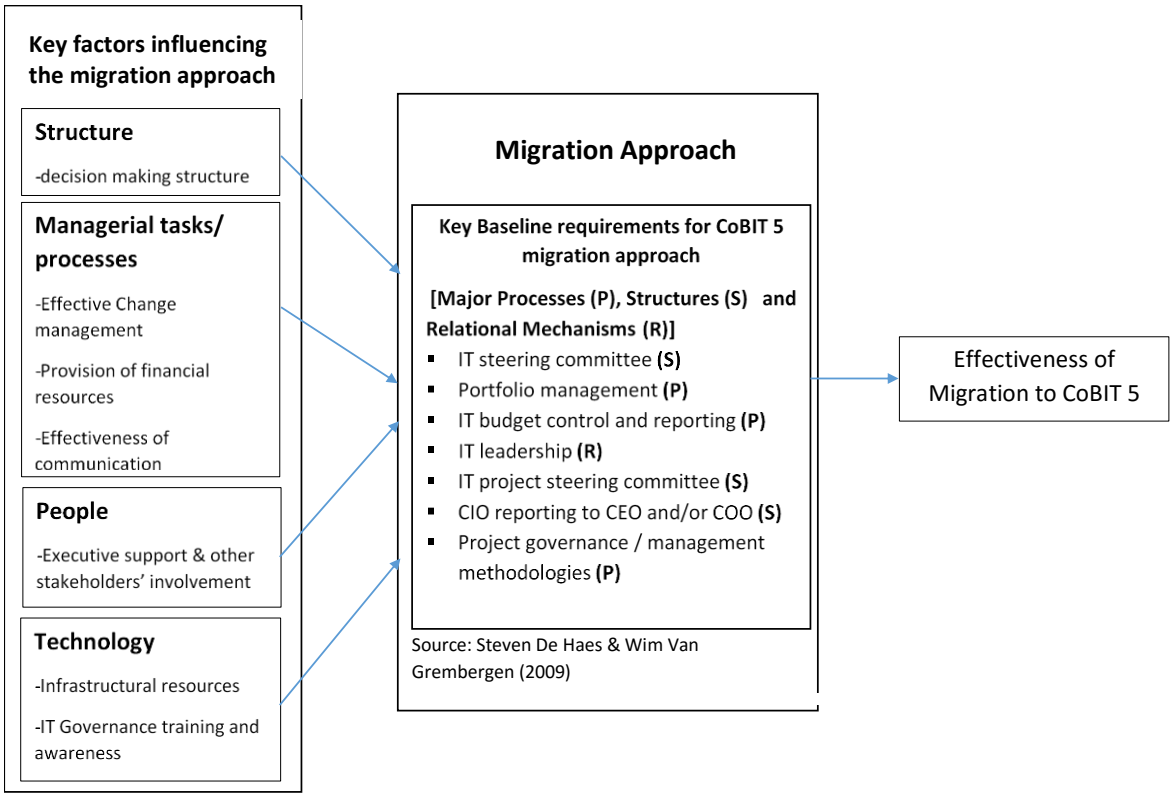


**Figure 1**: Conceptual Model for Effective Migration to CoBIT 5

### *2.4.1 Structure*

IT governance structure deals with the decision-making structures (or, decision loci) adopted for IT-related decisions (Grant & Brown, 2005). The three most prevalent governance structures are centralized, decentralized and hybrid structures (Huang et al., 2010; Helbig, Hrdinovà & Raup-Kounovsky, 2009). Ribbers et al. (2002) emphasize the strategic integration of IT/business decisions. Hence, a suitable decision structure needs to be adopted by organizations as a critical success factor in ITGF implementations. Because the focus on enterprise ITG and CoBIT 5 places responsibility and accountability with the top executives of a business, a centralized approach would be most appropriate as the executives employ a focused vision for the organization (Mohamed & Kaur, 2012). Stability is also necessary when implementing complex IT projects hence a centralized structure is appropriate (Pereira & da Silva, 2012). Therefore:

**Proposition 1: The decision making structure will influence the approach used for migration to CoBIT 5.**

### *2.4.2 Managerial tasks/ processes*

IT implementation requires substantial resources therefore appropriate budgetary control needs to be exercised and resources made available (Lee et al., 2008). Additionally, the implementation of IT systems often brings about changes which impact on existing tasks and processes. The way that individuals interpret the change to their business functions is as important as the actual change to the technology or business process itself. Consequently, an enterprise's approach to change management can have a greater impact on the success or failure of the ITG framework implementation or migration than the ability of the initiative to meet the business objectives for which it is intended (Kutzavitch, 2010). There is also need for appropriate communication of the intended changes to these tasks to the stakeholders. Effective communication fosters business/IT shared understanding which creates real participation and collaboration in the organization (Bowen et al., 2007). Therefore:

**Proposition 2: Managerial tasks/ processes will influence the approach used for migration to CoBIT 5.**

### *2.4.3 People*

This refers to an enterprise's executives' personal involvement in IT-related decision making and monitoring processes (Huang et al., 2010). Prior literature emphasizes the importance of senior management support and participation of stakeholders in IT implementations (Bowen et al., 2007; IT Governance Institute, 2011). Implementation of IT also requires engagement of other stakeholders. Roles must be clearly defined and shared understanding with the stakeholders created (Ribbers et al., 2002). Research has revealed that the more the organization involves key stakeholders, the more successful the governance of IT becomes (Nfuka & Rusu, 2010). This engagement will also aid willingness to adopt the changes that are introduced as these stakeholders gain a sense of contribution towards the change. Therefore:

**Proposition 3: Executive support and stakeholder involvement will influence the approach used for migration to CoBIT 5.**

### *2.4.4 Technology*

IT resources and IT Governance training and awareness are necessary if business operations are to be effective. Previous research suggests that many companies have difficulties associated with budget limitations for IT resources and infrastructure enhancement (Lee et al., 2008). Without the adequate investment into the appropriate supporting infrastructure, there is little chance of the migration or implementation being successful. Furthermore, providing adequate awareness and training is principal and acts as a stepping stone to the development of an effective implementation strategy and subsequently to effective CoBIT migration. It is the engine of innovation and optimization of IT capabilities and governance (IT Governance Institute, 2003; Tan et al., 2009). Therefore:

**Proposition 4: The technology used and its governance will influence the approach used for migration to CoBIT 5.**

As indicated above, De Haes et al (2013) uphold that efficient and effective implementation of CoBIT 5 requires a more holistic and comprehensive approach that takes into account several interacting components i.e. processes, organizational structures and human resources. These components categorize the baseline requirements; "the key minimum baseline composed of seven practices can be regarded as the necessary framework to implement Enterprise Governance of IT and these practices are supported by other studies as well. The very same factors are also viewed as crucial enablers for IT- business alignment" (Van Grembergen & De Haes, 2010), which is a core of IT Governance. We therefore propose that:

**Proposition 5: The comprehensiveness of the migration approach used to implement CoBIT 5 will determine the effectiveness of migration to CoBIT 5**

# 3. Research Methodology

Professionals responsible for IT/ Business and those with expertise in Governance, in organizations that are attempting migration to CoBIT 5 and those that have implemented some aspects of it were considered for the study. Based on their experiences and involvement in these business practices, such individuals have the requisite knowledge that would provide valuable insights on the research topic. Individuals in the banking and telecoms sectors were appropriate for this study since banking and telecoms are the most IT regulated environments (Guldentops, 2004) using IT-driven business models in this country. The researcher carefully sought to find a way to contact the banks and telecoms companies from which the study sample would be drawn. Using the Banking Association of Zimbabwe's website (www.baz.org) and the POTRAZ website (www.potraz.co.zw), the researchers discovered that there are 19 registered banking institutions and four operational mobile telecommunications companies. Online addresses were obtained and emails sent to the various banks and organizations. Five banks and one Telecoms Company agreed to participate in the study. 450 respondents were contacted, and the questionnaire sent to them via the online Qualtrics platform.

The questionnaire used in this study was approved by the ethics committee of UCT. Before the questionnaire was administered, permission was obtained from the participating organizations and the individual respondents through a signed research agreement. In this survey, they were requested to answer demographic questions that gave us an idea of their profiles, qualifications and experience. They were also asked to answer the study related questions based on their organization or based on one banking/ telecoms client organization for the external auditors. The latter section measured the extent to which respondents agreed or disagreed with statements as informed by literature on all constructs of the model. Except for the demographic data, all other items (dependent and independent variables) were measured using a five-point Likert scale.

## 3.1 Findings, Analysis and Discussion

### *3.1.1 Reliability of the measures*

A Cronbach Alpha threshold value (α) of at least 0.7 is typically required to confirm the reliability of data (Hair et al., 2006).

| Construct | No of items/variables measured | Cronbach's Alpha |
|---|---|---|
| **Structure** | 4 | 0.757924 |
| **People** | 7 | 0.788694 |
| **Managerial tasks/ processes** | 13 | 0.848746 |
| **Technology** | 6 | 0.816919 |
| **Comprehensiveness of migration approach** | 9 | 0.819839 |
| **Effectiveness of migration to CoBIT 5** | 8 | 0.867190 |

**Table 1:** Reliability Test Results using Cronbach Alpha

The results of the reliability test confirm the reliability of the data and the measures of the constructs. All the Cronbach alpha results are above the threshold of 0.70 (Parida et al., 2009).

### *3.1.2 Validity of Constructs*

Validation of the constructs was performed using factor analysis to examine that the actual constructs as perceived by the respondents could be uniquely identified (Cavana, Delahaye, & Sekeran, 2001). A total of 47 items, adapted and refined to the context of this research were used to measure the six factors included in the research model. The factor loading cut off was set to 0.5 and this was considered appropriate for this study to preserve the convergent validity of the factor structure even though some literature recommend the use of loadings greater than 0.4 for exploratory research (Cavana et al., 2001 p. 439). Items with poor or ambiguous factor loadings were deleted from subsequent analysis. Appendix B shows the Factor Analysis table and all the loaded constructs.

### *3.1.3 Response Rate*

A total of 84 usable responses were obtained (18.6% response rate). Such low rates may be obtained in web-based surveys as evidenced by similar studies where response rate of about 15 to 21.5% was achieved (Ali & Green, 2007, 2012; Bowen et al., 2007; Lunardi, Maçada & Becker, 2014).

## 3.2 Sample Characteristics & Descriptive Data

Respondents who participated in the survey were asked to indicate their job titles and gender among other characteristics. Of the 84 responses gathered, 29.8% were female while 70.2% were male. According to past literature, there are few women in the IT, Risk and Audit professions (Hilbert, 2011; Ndede-Amandi, Mbarika, Payton, Duplechain, & Mbarika, 2015). Furthermore, there is support showing even fewer women in the telecoms sector (James, Smith, Roodt, Primo, & Evans, 2006).

Job titles were categorized into seven major classifications. The mean IT Governance experience and familiarity with its implementation was measured to be about 2.6 years.

Checking for the central tendency and dispersion of the data gives the researcher an informed view of how the participants reacted to the items in the questionnaire (Cavana et al., 2001 p. 319). The descriptive statistics above indicate that most of the responses were distributed around the mean, suggesting that most respondents agree with the identification of the key factors that were measured.

The researchers performed a multiple linear regression to determine the impact of the independent variables on the dependent variable.

| N= 84 | | Frequency | Percentage |
|---|---|---|---|
| **A. Job classification** | | | |
| | Auditors | 20 | 23.8 |
| | Risk | 11 | 13.1 |
| | Governance | 2 | 2.4 |
| | IT | 39 | 46.4 |
| | Project management | 3 | 3.6 |
| | HR | 3 | 3.6 |
| | Accounting/Finance | 6 | 7.1 |
| **B. Experience and Familiarity** | | **Mean** | **Std. Dev** |
| | Work experience | 3.35 | 1.059 |
| | IT Governance experience | 2.60 | 1.299 |

**Table 2:** Sample Characteristics

| Variable | Descriptive Statistics | | | | |
|---|---|---|---|---|---|
| | Valid N | Mean | Min | Max | Std.Dev |
| People: Executive Support & other stakeholders' involvement | 84 | 3.452 | 2.14 | 5.00 | 0.618 |
| Technology: IT infrastructure, resources and Governance | 84 | 3.331 | 1.60 | 5.00 | 0.716 |
| Tasks/Processes: Making available Financial and infrastructural resources | 84 | 3.355 | 1.40 | 5.00 | 0.692 |
| Task/processes: Effective change management | 84 | 3.890 | 2.00 | 5.00 | 0.647 |
| Task/Process Effectiveness of communication | 84 | 3.343 | 1.80 | 5.00 | 0.643 |
| Structure: Decision making structure | 84 | 3.738 | 2.50 | 5.00 | 0.632 |
| Comprehensiveness of the migration approach | 84 | 3.426 | 2.00 | 4.78 | 0.663 |
| Effectiveness of migration to CoBIT 5 | 84 | 3.509 | 2.25 | 4.75 | 0.575 |

**Table 3:** Descriptive statistics

## 3.3 Discussion of findings

The findings indicate many of the key factors influence the comprehensiveness of the migration approach. This is consistent with earlier findings. For instance successful ITG implementation has been found to be supported by centralized decision making (Ferguson, Green, Vaswani, & Wu, 2013 p. 79; Van Grembergen & De Haes, 2010; Kearns & Sabherwal, 2007).

Support is provided for the prediction that the managerial tasks/ processes will influence the approach used for migration to CoBIT 5. Optimizing the organization's IT infrastructure and knowledge, and other critical IT capabilities (applications, information, and personnel) and adequate budget and funding of IT investments are necessary if the approach to migration of CoBIT 5 is to be successful (Guldentops, 2004). The results are therefore consistent with earlier findings that the change process needs to be managed well, through education and awareness and adequate communication, incorporating all stakeholders so as to avoid

resistance (Bowen, Cheung, & Rohde, 2007; Elnaga & Imran, 2013; Nfuka & Rusu, 2013; Othman & Chan, 2013).

**Regression analysis for Dependent Variable: Comprehensiveness of migration approach, R= .50765847 $R^2$= .25771712 Adjusted $R^2$= .22013318 F (4,79) =6.8571 p <0.00000**

| N=84 | b* | Std.Err. of b* | b | Std.Err. of b | t(79) | p-value |
|---|---|---|---|---|---|---|
| Intercept | | | 0 | 0.096354 | 0 | 1 |
| Structure | 0.342 | 0.115 | 0.243 | 0.115 | 2.111 | 0.038 |
| Managerial Task/Processes | 0.243 | 0.118 | 0.244 | 0.118 | 2.062 | 0.043 |
| People | 0.243 | 0.102 | 0.243 | 0.102 | 2.376 | 0.020 |
| Technology | 0.244 | 0.104 | 0.276 | 0.084 | 3.291 | 0.001 |

**Table 4:** Regression Analysis for Comprehensiveness of migration approach vs Independent factors

**Regression Summary for Dependent Variable: Effectiveness of migration to CoBIT5, R= .42104955 $R^2$= .17728272 Adjusted $R^2$= .16724959 F (1,82) =17.670 p < 0.0000**

| N=84 | b* | Std.Err.of b* | b | Std.Err.of b | t(82) | p-value |
|---|---|---|---|---|---|---|
| Intercept | | | 0 | 0.099568 | 0 | 1 |
| Comprehensiveness of migration approach | 0.421 | 0.100 | 0.421 | 0.100 | 4.204 | 0.000 |

**Table 5:** Regression analysis for effectiveness of migration vs comprehensiveness of migration approach

### *3.3.1 Hypotheses testing and interpretation of results*

| Proposition | Description | Outcome |
|---|---|---|
| 1 | ***The decision making structure will influence the approach used for migration to CoBIT 5.*** | Supported |
| 2 | ***Managerial tasks/ processes will influence the approach used for migration to CoBIT 5.*** | Supported |
| 3 | ***Executive support and stakeholder involvement will influence the approach used for migration to CoBIT 5.*** | Supported |
| 4 | ***The technology used and its governance will influence the approach used for migration to CoBIT 5.*** | Supported |
| 5 | ***The comprehensiveness of the migration approach used to implement CoBIT 5 will determine the effectiveness of migration to CoBIT 5*** | Supported |

**Table 6:** Results of proposition testing

There is also support for Proposition 3 which proposes that the involvement and support of executives and other key stakeholders will influence the comprehensiveness of the approach used for migration to CoBIT 5. This suggests that the participation of senior management through their involvement in strategic IT matters, prioritization of IT related resources and requirements, and the expertise that they possess about IT opportunities and possibilities within their organization positively influences the comprehensiveness of the approach used for migration to CoBIT 5. More particularly, senior management support is to be considered a critical enabler of business and IT alignment which is one of the focus areas of ITG (Luftman et al., 1999; Bowen et al., 2007). This assertion is further supported by the ITGI and is reflected substantially in the CoBIT 5 framework (ISACA, 2012; Lubbad & Ashour, 2014). We also found support for the last proposition that the comprehensiveness of the approach used for migration to CoBIT 5 would determine the effectiveness of migration to CoBIT 5.

# 4. Conclusion and recommendations

The significance of ITG is evident through the attention it has received from researchers and practitioners. Unfortunately, the focus of extant research on ITG, ITG effectiveness, and even ITG frameworks implementations or migrations are separate from its link to challenges or key influencing factors. Literature revealed that implementation of CoBIT 5 is a daunting challenge given the complexity of the framework (De Haes, Van Grembergen, & Debreceny, 2013). Furthermore, organizations do not know when it is appropriate to migrate and how to achieve this migration. Bridging this gap, this study sought to explore the challenges associated with migration to newer ITG frameworks like CoBIT 5 and to identify and document those critical factors that influence the effectiveness of this migration. The support of senior management and involvement of other key stakeholders, the effectiveness of communication, ITG training and awareness, effective change management, the availability of financial, infrastructural and human resources and a comprehensive migration approach were found to be necessary considerations in developing the process of migration to CoBIT 5. We therefore argue that, organisation should embark on the migration only when these aspects are reconciled.

The ‘how to migrate' is addressed by the comprehensiveness of the migration approach. The results of the study revealed that the seven minimum baseline requirements are essential for the successful implementation of CoBIT 5. These seven practices are regarded as the necessary framework to implement an enterprise ITGF, and these practices are supported by other studies as well (Huang, Zmud, & Price, 2010; Van Grembergen & De Haes, 2010). Until now, many enterprises have persisted in viewing IT as merely supporting other business processes, instead of seeing IT as a strategic business partner (Lee, Lee, Park, & Jeong, 2008). As such, businesses are genuinely unaware of how they might leverage IT in achieving competitive advantage, IT- business alignment or value creation/ delivery.

This study makes a contribution to existing academic and practitioner research relating to IT governance and CoBIT 5 implementation. The conceptual model developed in this study can be used to guide practitioners during their implementation of CoBIT 5 in that it utilizes findings (factors influencing ITG) from prior studies and adapts them to a new context of migration that has not be widely explored thus creating literature. It further justifies the factors investigated by drawing from Leavitt’s model and Van Grembergen’s model,

producing a conceptual framework hence advancing theory. The model will help organizations by providing insight on the suitable timing to migrate and how to perform such migrations effectively with the appropriate ITG practices in place.

It is worth mentioning that the relationships between determinants call for more exploration given that this study only observed the linear relationships and impacts of the factors. In practice, there exist varying degrees of interplays between the components. For example, Doll & Torkzadeh (1987) and Raghunathan & Raghunathan (1989) reveal a significant positive relationship between the use of IT steering committees and the involvement of senior management. However, such an examination of potential interaction effects was beyond the scope of the present study and is left for future research.

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# APPENDIX A. – FACTOR ANALYSIS

| | | Factor Loadings (Varimax normalized) (IT_Governance_Framework_Migrati in ITGthesisfinal.stw) Extraction: Principal components (Marked loadings are >.500000) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Variable** | **COMM Clear Policies** | **EFF Std ITG Processes** | **COMP IT Budget Ctrl** | **DM Central Authorize** | **TA Migration guideline** | **FIR for strategic objective** | **TMS/EKS IT resource priority** | **CM Std procedure** |
| **NEW-TMS/EKS** | Involved in strategic matters related to the use of IT | -0.010 | 0.000 | 0.075 | 0.234 | 0.298 | 0.106 | **0.533** | 0.314 |
| | Priority given to IT related resources and requirements* | 0.087 | 0.066 | 0.269 | 0.035 | 0.243 | 0.100 | **0.753** | -0.204 |
| | Board actively involved in the direction & priorities of IT | 0.036 | 0.148 | 0.058 | 0.240 | 0.272 | -0.028 | **0.650** | 0.047 |
| | Shared understanding among stakeholders on IT agenda | 0.106 | 0.084 | 0.023 | -0.054 | 0.206 | 0.191 | **0.560** | 0.371 |
| | Active participation in IT planning and implementation | 0.085 | 0.191 | 0.172 | -0.111 | 0.018 | 0.224 | **0.627** | 0.193 |
| **AVG_TA** | Awareness of need for optimal and cost-effective use of IT | 0.245 | 0.071 | 0.136 | -0.039 | **0.571** | 0.209 | 0.087 | 0.038 |
| | Training on good IT governance practices | 0.464 | 0.063 | 0.187 | -0.033 | **0.519** | -0.147 | 0.311 | 0.028 |
| | Awareness of necessary ITG structures, processes and relationships | 0.192 | 0.045 | 0.128 | 0.151 | **0.687** | 0.139 | 0.343 | 0.028 |
| | Change mgt incorporated in ITG best practices awareness & training | 0.058 | 0.064 | -0.025 | 0.346 | **0.612** | 0.120 | 0.175 | 0.056 |
| | IT process guidelines for mgt, IT staff & users to guide ITG migration* | 0.084 | 0.208 | 0.174 | 0.185 | **0.770** | 0.075 | 0.091 | 0.003 |
| **NEW-FIR** | IT resources, infrastructures, and skills to meet strategic objectives* | 0.269 | 0.243 | 0.139 | 0.017 | 0.102 | **0.699** | 0.194 | 0.080 |
| | Investments in IT resources, infrastructures, and skills to ensure effective ITG framework migration | 0.481 | 0.304 | 0.138 | 0.148 | 0.237 | **0.535** | 0.053 | -0.097 |
| | Standardized & sharable IT infrastructure & apps to optimize costs | 0.079 | 0.205 | 0.279 | 0.154 | 0.291 | **0.688** | 0.168 | -0.051 |
| | Clear IT budget control, reporting and responsible usage analysis done | 0.099 | 0.030 | 0.488 | 0.218 | 0.029 | **0.580** | 0.056 | 0.111 |
| **NEW-CM** | Defined change management structure | 0.153 | -0.012 | 0.197 | -0.040 | 0.369 | 0.494 | -0.037 | **0.573** |
| | Procedure for changes related to IT processes, IT related business transactions and IT related software or hardware* | -0.029 | 0.044 | 0.203 | 0.275 | 0.051 | 0.014 | -0.023 | **0.709** |
| | Users notified of changes to IT systems, related processes & procedures | -0.112 | 0.218 | 0.102 | -0.004 | -0.083 | 0.075 | 0.149 | **0.684** |
| | User adequately prepared for IT related processes & procedures changes | 0.159 | 0.390 | 0.023 | 0.041 | 0.116 | -0.034 | 0.019 | **0.702** |
| | Frequent communication between business and IT | 0.352 | 0.231 | 0.057 | 0.139 | -0.109 | -0.040 | 0.210 | **0.504** |
| **NEW-COMM** | Business- IT goals, strategies effectively communicated & understood | **0.522** | 0.236 | 0.141 | 0.369 | 0.186 | 0.243 | 0.035 | 0.283 |
| | IT strategies & policies are clearly written for users to understand them* | **0.760** | 0.092 | 0.141 | 0.115 | 0.218 | 0.210 | -0.102 | 0.126 |
| | IT strategies & policies are communicated & accessible to all users impacted by IT projects. | **0.689** | 0.040 | 0.087 | 0.029 | 0.159 | 0.158 | 0.218 | -0.026 |
| | Feedback about IT strategies & policies relayed to IT steering committee | **0.581** | 0.302 | 0.110 | 0.218 | 0.227 | -0.086 | 0.314 | 0.090 |
| **NEW-DM** | IT related Policies authorization decisions made centrally* | 0.105 | 0.188 | 0.092 | **0.807** | 0.144 | -0.093 | -0.100 | 0.241 |
| | Decisions on future IT- enabled investments held centrally | 0.098 | -0.021 | 0.046 | **0.775** | 0.111 | 0.290 | 0.218 | 0.062 |
| | Decisions relating to hardware & software acquisitions made centrally | 0.139 | 0.163 | -0.068 | **0.801** | 0.140 | 0.064 | 0.094 | 0.025 |
| **NEW-COMP** | IT steering committee | 0.169 | 0.155 | **0.629** | 0.020 | -0.086 | 0.019 | 0.140 | 0.291 |
| | IT project steering committee | 0.157 | 0.262 | **0.688** | -0.240 | 0.137 | -0.047 | 0.159 | 0.049 |
| | IT budget control and reporting* | 0.054 | -0.059 | **0.741** | -0.019 | 0.149 | 0.176 | 0.083 | 0.113 |
| | CIO reporting to the CEO/COO | -0.404 | -0.032 | **0.540** | -0.083 | 0.229 | 0.241 | 0.039 | 0.194 |
| | IT leadership | -0.006 | -0.112 | **0.661** | 0.313 | -0.082 | 0.188 | 0.008 | 0.172 |
| | Project governance/management methodologies | 0.113 | 0.290 | **0.698** | 0.213 | 0.172 | 0.022 | 0.163 | -0.052 |
| | Practices working together in harmony | 0.112 | 0.347 | **0.575** | -0.017 | 0.189 | 0.162 | 0.073 | 0.025 |
| **NEW-EFF** | Efficient prioritization of business and IT initiatives | 0.068 | **0.507** | 0.110 | 0.154 | -0.139 | 0.362 | 0.229 | 0.284 |
| | Current ITG structures, processes & relationships promote the working together and sharing of ideas between IT and business | 0.141 | **0.629** | 0.026 | 0.182 | 0.097 | 0.308 | 0.151 | 0.271 |
| | Degree of standardization, documentation & formulation of ITG processes* | 0.085 | **0.813** | 0.154 | 0.012 | 0.058 | 0.030 | 0.053 | 0.028 |
| | Monitoring mechanisms - adherence to IT related processes & procedures | 0.067 | **0.726** | 0.077 | 0.079 | 0.211 | 0.086 | 0.193 | 0.283 |
| | Migration procedures/phases clearly documented & communicated before | 0.168 | **0.708** | 0.215 | 0.163 | 0.064 | 0.057 | 0.034 | 0.080 |

**APPENDIX** B. **– SUMMARY OF MEASUREMENT AND SOURCES**

| Variable/ Construct Name | Sources |
|---|---|
| Executive Support & other stakeholder involvement | (De Haes & Van Grembergen, 2005; Huang et al., 2010; Luftman et al., 1999; Nfuka Ngemera & Rusu, 2011; Ribbers et al., 2002; Teo & Ang, 1999; Weill & Ross, 2004b) |
| Availability of Financial & Infrastructural Resources | (Gill et al., 2005; Gottschalk, 1999; Guldentops, 2002; Lee et al., 2008) |
| Effective Change Management | (ITGI, 2003; ITGI and PwC, 2006, Cater-Steel, Tan, & Toleman, 2009; Guldentops, 2002; Haes & Grembergen, 2008; Nfuka & Rusu, 2011) |
| IT Governance Awareness and Training | (Nfuka & Rusu, 2011; Tan et al., 2009; Warland & Ridley, 2005); |
| Effectiveness of Communication | (Bowen et al., 2007; Coopers, 2006; Guldentops, 2004; Haes & Grembergen, 2008; Luftman et al., 1999; Nfuka & Rusu, 2010; Tan et al., 2009; Teo & Ang, 1999; ITGI, 2003, ITGI and PwC, 2006) |
| IT Decision Making Structure | (Huang et al., 2010; Luftman et al., 1999; Nfuka & Rusu, 2010; Sandrino-Arndt, 2008; Weill & Woodham, 2003; Weill & Ross, 2004) |
| Comprehensiveness of Framework used to implement COBIT 5 | (Ali & Green, 2012; Bowen et al., 2007; De Haes et al., 2013; ISACA, 2012; Van Grembergen & De Haes, 2009; Van Grembergen & De Haes, 2010) |
| Effectiveness of Migration to CoBIT 5 | (Ferguson et al., 2013; Goodhue & Thompson, 2006; Huang et al., 2010) |