IT GOVERNANCE: AN ARCHITECTURAL FRAMEWORK BASED ON CONSOLIDATED BEST PRACTICES

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Abstract

Due to the continual increase of the significance of information technology (IT), the need to provide governance in the deployment, use and management of the artefacts is simultaneously essential. However, even though different frameworks have been employed, the implementation of IT governance has never been easy for many organisations. This is attributed to many factors, such as people, process and technological artefacts. IT governance frameworks differ in one area or another, making their selection challenging for organisations. As a result, some organisations have more than one IT governance framework. This, on one hand, sometimes results in duplication of the frameworks' functionalities, thereby adding to the environment complexity. On another hand, some IT governance frameworks are short of functions in regard to the organisation's objectives. These challenges are attributed to the lack of an architectural framework, of consolidated best practices.

Keywords: Information Technology, Best Practices, Framework, Architecture, Implementation, Diffusion of Innovations

1. INTRODUCTION

Many organisations increasingly depend on information technology (IT) for the realisation of their business objectives and activities. Gillies and Broadbent (2005) did argue that such dependency on IT increases the risk of operational failure in many organisations. According to Mohamed and Singh (2012, p. 90), approximately 67% of IT projects fails or are challenged to justify their investment in IT. These challenges could be attributed to factors that are not IT related. Thus, Mohamed and Singh (2012) highlighted that IT challenges are centred on governance. Thus, some organisations employ best practices. Nelson, Wells, Perry and Hanson (2004) described best practices as the company' approaches and strategies pursued by thriving and well respected organisations.

Best practice frameworks are exclusive to every organisation according to the nature of their unique businesses and competitiveness. There exist a number of best practices frameworks, which could be employed to manage IT. According to Ko and Fink (2010), the most commonly applicable and accepted of the best practices frameworks, include Control Objectives for Information and Related Technology (COBIT), The Open Group Architecture Framework (TOGAF), and International Standards Organisation (ISO 17799:2000). Although these best practice frameworks differ in principle, they all intend to improve IT efficiency through governance (Wessels & Van Loggerenberg, 2006). Another important factor is how the best practices are implemented, which varies in the different organisations.

Implementation alludes to the use of methods to accept and integrate approved mechanisms and amend repetitive patterns within a specific setting. Implementation provides new knowledge and a general understanding regarding processes, difficulties and strategies to deploy, verify and improve models, theories, assumptions and principles. It also produces consistent strategies for improving information technology processes and outcomes for organisations (Schillinger, 2010).

The aim of this research was to develop an architectural framework which is based on consolidated best practises. The framework is intended for the implementation of IT governance in organisations. The research therefore explored the different best practice frameworks' attributes and understand how organisations select and implement best practice frameworks for their needs.

The remainder of the paper is structured into four main sections. The first two sections cover the review of related literature and the research methodology, respectively. The third section presents the data analysis, followed by the fourth section which discusses the Framework. Finally, the paper is concluded.

2. INFORMATION TECHNOLOGY AND GOVERNANCE FRAMEWORKS

Information technology (IT) performs major roles in organisations, which includes business processes, procedures, innovations and new product development (Chan, 2000). Devos, Van Landeghem and Deschoolmeester (2011) concluded that because of the vital role that IT has in organisations, IT governance must be adopted to sustain and enable business objectives and to mitigate related risks. In addition, IT innovation adds more complexity to the challenges, which presents new risks and vulnerabilities for governance to address (Gomes, 2007).

Best practice frameworks assist with the governance of IT deployment, use and management. Several best practise frameworks are available to manage IT and to assist IT to achieve the business objectives, through governance (Terblanche, 2011). Nelson et al., (2004) argued that while companies in a certain industry may not follow all the best practices, it is widely accepted that "better" companies follow several or a majority of the best practices. Some of the commonly employed frameworks by many organisations include COBIT, ITIL and TOGAF.

Control Objectives for Information and related Technology (COBIT) according to Tuttle and Vandervelde (2007) is a globally accepted set of tools and processes organised into a framework that business executives can utilise to make sure that their IT is assisting them to accomplish their goals and objectives. Lainhart IV (2000) argued that COBIT is so broad that it cannot be applied to every situation and therefore needs to be customised to a particular environment. Not all control objectives, high-level or detailed, will be applicable within all organisations as they will depend on the type of industry an organisation operates in. Although a vast number of processes, activities and responsibilities are described, the connection between them is not specified, for example, the determined helpfulness of an activity and how that is reflected in the featured maturity model (Simonsson, Johnson & Wijkström, 2007).

However, according to Shivashankarappa et al., (2012) COBIT has not been greatly effective in offering tangible benefits around governance, controls, audit and other features of organisational security as it is time-consuming and too much resource intensive to implement. Another major shortcoming with COBIT and maybe the main reason why the framework is not used more frequently by organisations is that a great deal of knowledge about the framework is needed in order to apply it as a tool to support IT governance or evaluate an organisation's IT performance. Hence, a number of organisations may choose to tailor the information, making it applicable to their specific environment (Simonsson et al., 2007).

While COBIT is argued to describe *what* has to be done, Information Technology Infrastructure Library (ITIL) provides the practical steps to answer *how* it should be done and *who* should perform each task (Van Grembergen, De Haes and Gultentops, 2003). One of the major challenges of any framework is lack of commitment and support from management who do not understand the key role they must play to support other processes. Attracting and justifying funding for ITIL training is a challenge, since it is typically out of sight of the customer units. According to Pollard and Cater-Steel (2009), critical success factors attributed to the successful implementation of ITIL include, amongst others, executive management support, interdepartmental communication and collaboration, use of consultants, training, and careful software selection.

Harris (2010) posited that The Open Group Architecture Framework (TOGAF) is an enterprise architecture framework that proposes an approach to design, plan, implement and maintain enterprise architecture. Enterprise architecture (EA), as articulated by Iyamu and Hamunyela (2013), can help organisations to construct strategies and integrate them with current processes, IT infrastructure and other units of the organisation. As such, EA like the other IT components needs to be managed and governed with the aid of a framework such as TOGAF.

3. RESEARCH METHODOLOGY

The qualitative method and case study approach were employed in the research. These selections were based on the research aim, as stated in the introduction section. The data was analysed interpretively. Myers (2009) argues that qualitative research method, such as case study enables researchers to study phenomena in their natural settings. According to Straub, Gefen and Boudreau (2004), quantitative research is a series of methods and techniques that permit Information Systems (IS) researchers to respond to research queries about the interaction of human beings and computers. The case study approach was employed in the study. Yin (2003) described a case study as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context. The case study approach is helpful in examining the *why, how and what* questions (among the question series of: who, what, where, how and why), which are queries about the present set of events over which the researcher has little or no control (Moon, 2007). RedLeaf Communications in South Africa was used as the case study.

RedLeaf Communications was established as a government enterprise to provide postal and related services to the South African public. RedLeaf Communications is a South African organisation with geographically dispersed operations across the country. The organisation was founded in 1910. The organisation employs more than 15,546 employees and operates more than 2,400 outlets throughout the country. At the time of the study the organisation consisted of four (4) core divisions and subsidiaries and five (5) support divisions (corporate services). The support divisions are IT, transport services, business support, including finance and audit; properties and a retail division.

The researcher obtained the necessary permission to conduct the study from the appropriate authorities at the organisation, RedLeaf Communications. A total of ten (10) participants were interviewed. The participants or employees were labelled as follows: RL00 to RL09, for confidentiality purposes.

Two sets of data were collected based on the objectives of the study. Both sets were qualitative, but used different techniques and approaches. The first set of data was textual, involving documentation relating the different types of frameworks. This data was collected from the vendors and owners of the products. This was primarily to understand the attributes of the various frameworks and draw contrasts among them. The second set of data was collected by means of semi-structured interviews, the goal was to understand how and why certain frameworks were selected and implemented in the organisations.

Nemutanzhela and Iyamu (2011, p. 244), stated that the "DoI theory communicates technological innovation through specific networks, over time, among members of society". DoI relates to ways in which technological concepts, objects or methods, or a new practice of an old one, move from conception to usage (Chigona & Licker, 2008). The Innovation Decision Process in its five stages is a process that

happens while people take part in a range of activities related to choices (Rogers, 2003). The five stages according to Rogers (1995) include:

- *knowledge,* occurs when people are cognisant of innovation and comprehend its meaning;
- *persuasion* happens when personnel and management shows that they favour or do not favour the innovation and need to be persuade;
- *decision* involves the acceptance or rejection of the innovation by the people or management;
- *implementation* is when the personnel or management make a decision to employ the innovation; and
- *confirmation* occurs when personnel and management choose to approve or discard their choice to endorse the innovation.

Chief Information Officer (CIO), IT executive managers, senior managers and managers were categorised as senior and the rest of the employees as juniors. The researcher was aided by an employee, nominated by the CIO to identify potential interviewees. The selection of interviewees was based on two factors, knowledge and availability:

- Knowledge – employees were selected based on their knowledge of the organisation, as well as the subject of the interview.
- Availability – it was difficult for the researcher to have access to some of the employees.

4. DATA ANALYSIS AND FINDINGS

As earlier stated, the data analysis was guided by DoI, from the perspective of Innovation Decision Process, which includes *knowledge* and *persuasion, decision, implementation,* and *confirmation* (Roger, 2003).

4.1. Innovation Decision Process: Knowledge

The selection, implementation and use of the IT governance frameworks depended on two main components, resources and skill. The use of resources and skill were based on the knowledge of individuals and groups in the organisation.

The resources that were involved in the selection, implementation and management of IT governance frameworks at RedLeaf Communications included both technical and non-technical factors. The technical factors were mainly technology infrastructures, which consist of hardware and software. The governance of the infrastructures was based and driven by individual and group knowledge about the technologies. This shaped how infrastructures were selected and managed in the organisation. Some of the non-technical factors included processes and people. The processes that were employed in the governance of IT artefacts were based on individual's skills, which manifest from knowledge. The selection, implementation and use of IT governance frameworks require special skills and, therefore, not all employees could be tasked to undertake the responsibility.

The employees who were assigned the tasks of IT governance in the organisation were formally trained. The type of knowledge that was gained from the training was a mixture of both explicit (codified knowledge gathered from sources, such as documentation and databases) and tacit knowledge (non-codified, personal or experienced-based, know-how knowledge). The knowledge guided the selection, implementation and management of the three (e.g. COBIT, ITIL and TOGAF) core IT governance frameworks in the organisation.

Both explicit and tacit knowledge has a crucial influence on the success or failure of an innovation such as the governance framework in an organisation. This is based on how information is shared and used in the selection, implementation, continuous improvement and management of IT governance frameworks. According to one of the interviewees, "e*verybody should be knowledgeable on how information about IT governance flows in the organisation. A suggestion would be to set up a community of practice, a forum where people can share information about IT governance frameworks and processes. This is to help us achieve our goal about IT governance in the organisation (*RL02, p14:419-422)".

Explicit and tacit knowledge complement each other, meaning both types of knowledge are essential to innovation. As a result, how employees acquired and used their explicit or tacit knowledge is important to the selection and implementation of IT governance framework for the organisation's strategic purposes. Considering that the application of knowledge is critical (whether explicit or tacit), employees need to be educated, primarily because the organisation, through its board of directors (BoD) depend on their expertise, advice and recommendation. One of the interviewees explained as follow: "*A representative of the governance team is tasked on advisory role, to advise and recommend to the board on the need and propose of IT governance and policies in the organisation* (RL05, p51:1737-1738)".

Employees evaluate the validity and reliability of information manifesting from their knowledge before providing advice and recommendations to the board of directors. An employee described the evaluation of information as follow: "*So it's iteration; it has to be a constantly evolving process. Put governance in please, constantly do risk assessments to evaluate and give feedback, but more important than anything, constantly check for how the company's adhering to that governance through compliance* (RL03, p34:1109-1111)".

Explicit knowledge without tacit understanding rapidly loses its meaning. Explicit knowledge therefore has to be reframed or interpreted using a person's frame of reference so that it can be understood and then internalised or accepted to others. It could therefore be significantly useful in this context, in that the explicit knowledge that is required in the selection of an IT governance framework could be extended to tacit knowledge that could be applied in innovative ways to facilitate the implementation of the IT governance framework in the organisation. However, this was not the case in RedLeaf Communications. One of the interviewees explained her opinion: "e*mployees are sent on training, but when they come back they do not practise what they have learnt. As a result, they forget what they learnt from the training quite quickly, which was a loss to the organisation as it impacts their contributions to how IT governance is selected, implemented, and managed* (RL07, p69: 2417-2419)".

The employees who were involved in IT governance in the organisation were selected based on the managers' discretion and prerogative. This was based on the power bestowed on the managers in the organisation. Also, the managers used the power to nominate those that could undertake

training on IT governance. Based on the aforementioned there is a need for a repository, to store and manage knowledge. The repository will be enabled and supported by technology.

The IT steering committee is a sub-committee of the BoD in the organisation. As at the time of this study, the committee was responsible for the IT strategy and IT governance framework in the organisation. Some challenges were experienced with the IT steering committee. One of the most critical challenges was that many of the committee members did not seem to understand the benefits of IT governance frameworks in the organisation. As a result, IT governance issues were either delayed or did not get the attention they needed. This led to discouragement of many employees who were tasked with IT governance. One of the employees expressed her frustration as follows: "*IT governance is a top-down approach; as a result, the actions of the top management affect our activities. The IT governance framework that we drafted over a year ago has not been reviewed until now* (RL04, p35:1155-1157)*".*

The data found critical factors with respect to the knowledge stage of the Innovation Decision Process, namely evaluation of information, need for a technology repository and education and training.

4.2. Innovation Decision Process: Persuasion

The success or failure of innovation in an organisation is influenced and impacted by employees' buy-in (management included), which is often a manifestation of persuasion by the focal actors. The selection, implementation and management of IT governance frameworks necessitate a change in the attitudes of employees towards the innovation. Employees will either believe in or doubt the innovation and thus develop either a positive or negative attitude towards it. This was explained by one of the interviewees: "…o*ne of the challenges is the buy-in of key stakeholders, such as your board members, top management, operation management and non-management employees* (RL05, p49:1655-1659)".

Employees can be persuaded to buy into an innovation by using different means, such as knowledge, awareness and resources. Employees need to be made fully aware of the situation to enable them to make an informed decision in the selection and implementation of IT governance. Such awareness can be created through different media, such as training and internal dissemination of information, as well as meetings and discussions amongst peers, which can be utilised both consciously and unconsciously in getting buy-in or persuading employees in the organisation.

Reluctance to deviate from the current way of doing things had an impact on the introduction, selection and implementation of IT governance in the organisation. The findings showed that some of the employees at RedLeaf Communications preferred to continue doing what they had always done, seeing that it worked for them. This emphasised the importance of top management instituting a persuasion campaign to influence employees to adopt the selected IT governance frameworks. One employee explained*: "There should appropriate workshops, change management, discussions to say, this is the new compliance requirement in the organisation and people need to be involved. It has to be a very interactive approach so that whoever has been exposed to that will know from now on this is how the behaviour needs to be changed* (RL01, p10:292-295)".

As activities had been conducted in a certain manner for a long period of time, many of the employees were reluctant, or found it difficult, to amend or adjust the ways in which they were carrying out their day-to-day activities. According to one of the interviewees, "e*mployees felt the selection, implementation, and management of IT governance frameworks will not add value to their daily operations, or to their day-to-day activities.* (RL05, p49:1658-1662)"

With the implementation of IT governance frameworks employees need to perform activities such as risk assessments and compliance audits. They perceive these activities as being unnecessary and cumbersome. The CIO expressed his concerns in this regard as follows: "*The first basic challenge I see is people do not understand the risk that is involved by not following governance. The second is the perception about governance is that it's a cumbersome unnecessary evil* (RL07, p68:2367-2369)".

Lack of awareness and knowledge on the part of employees resulted in some of them feeling uncertain about the implementation and management of IT governance frameworks as it differed from what they considered the norm. Some employees had discussed the advantages and disadvantages of the innovations with peers to try to determine whether the innovation would add value to the daily operational functions. According one of the interviewees:, "*I'm not sure why the organisation selected and implemented IT governance frameworks. During a discussion with a colleague I gathered and understood why the IT governance frameworks were selected and deployed, and why they need to be managed, once deployed (*RL06, p55:2071-2074)".

Such persuasion would lead to a change in the attitude of some of the employees. Other factors that were revealed were exclusivity and bureaucracy. The findings showed that there was exclusiveness in the manner in which IT governance frameworks was selected and implemented in the organisation. The selection, implementation and management of IT governance frameworks followed a process that was considered to be bureaucratic by some of the employees who were uncomfortable with the kind of bureaucracy that was instituted in the organisation, when it came to the selection and implementation of the IT governance framework. According to one of the interviewees, "…*the bureaucracy in the organisation is posing a challenge towards the adoption or rejection of an innovation,* this includes *lengthy processes and procedures which can take up to months to be finalised has a negative impact on innovation. By the time a process is finalised some of us might have forgotten about the primary aim* (RL08, p76:2638-2642)".

One of the consequences of the bureaucratic process was the long time it took between selecting a particular IT governance framework and when it was implemented. This led employees to wonder whether implementing the IT governance framework would still be relevant to their environmental settings and the organisation as whole, or not. Employees had to make a decision whether to adopt or reject the implementation of IT governance frameworks.

4.3. Innovation Decision Process: Decision

Decision making is a daily activity in many organisations, and RedLeaf Communications is not an exception. On the one hand effective and successful decisions are associated with favourable outcomes in organisations. However, on the other hand, ineffective and unsuccessful decisions generally have unfavourable results. The decision making process is therefore considered to be critical to organisations. One of the interviewees explained: "*…people in strategic position make decisions that have financial implication, but those decision makers are not held accountable if the decision has a negative impact on the organisation, in the context of IT governance* (RL06, p52:1767-1765)".

Many of the decisions made at RedLeaf Communications were based on both the organisational and IT strategies. The decision in the selection, implementation, and management of IT governance framework needed both the management and employees to consider the positive and negative consequences and impact the innovation would have on the organisation's strategy. One of the employees explained that the decision to select and adopt IT governance frameworks was based on the IT strategy activities: "*I think the factors would be determined by the strategy of the organisation. The IT strategy should be aligned to the organisational strategy. The IT strategy will then be able to determine which frameworks we have to use, because we need to know where we are going, and to go there what we need to use, what's going to work for us, and where's the industry going as well. And based on that then you can make your decision* (RL08, p76:2646-2652*)".*

Another interviewee was of the view that the decisions to select, implement, and manage IT governance frameworks were not based on the strategy, because at the time of this study, there was no strategy in the IT department. The interviewee further explained: "*…there were no overarching strategies which inform or guide employees' activities in many circumstances, such as the IT governance. Employees are not clear on what their mandates are and what is expected of them. It causes confusion regardless of whether you have sufficient people to support those function or not. If there is no senior management support and strategic direction, it is going to fail regardless of how good the skills you have, trying to achieve that governance or manage it* (RL02, p23:719-724)".

However employees were engaged in activities that manifested in the adoption or rejection of the IT governance innovation in the organisation. Some employees found it difficult to adopt the IT governance frameworks without proper testing, evaluation, and assessment of its usefulness and fit in their environments. According to one of the interviewees: "*…people think about process maturity, deliverables, and whether they can use the innovation (IT governance framework) to better enable their activities, and more effectively and efficiently. And can I test it, also, do I have evidence that I can deliver to show that the innovation is working* (RL04, p34:1212-1214)*".*

Those employees who tested and evaluated the IT governance frameworks influenced the decision to have it adopted in the organisation. This was based on the fact that there was a certain degree of advantage for the organisation. One of the employees provided the following explanation: "*…the selection, implementation, and management of IT governance framework formalise and put a structure in place for executing initiatives and activities. This includes formal policies that were formulated, to guide decisions that are made. The policies were needed because they determine the rules which form the standards, and the standards provide guidance for processes and procedures to follow (*RL03, p 24:772-777)".

Decision making is a mental as well as intellectual process, which requires factors, such as knowledge, skills, experience and maturity on the part of decision maker. Thus the decision to adopt or reject the selection, deployment and management of IT governance framework requires employees to be knowledgeable and skilful and show an interest in the innovation.

Once the decision to accept the selection of the IT governance frameworks had been made, execution (implementation) of such decision was embarked upon and employees who had not been involved in the decision making participated in the implementation of the decision. This had an impact on how IT governance was viewed in the organisation.

4.4. Innovation Decision Process: Implementation

The decision to implement IT governance was considered to be critical at RedLeaf Communications. This was attributed to the fact that implementation determines the end, which is the means. The implementation process involved both technical and non-technical factors, such as practices, structure, culture, hardware, processes and individuals. This included the roles and responsibilities of the factors, which were to employ the innovation and ensure that it functioned properly in the organisation.

Successful implementation of an innovation is facilitated by having a supportive structure and a culture that embraces the deployment and management of the IT governance frameworks that were selected. Referring to the structure of the organisation one of the interviewees stated, "*Currently, the structure does not allow for smooth operation between IT and business. There are no clear roles and responsibilities where everybody knows what is expected of them* (RL02, p13:399-402)".

It was noticeable that the organisational structure was not clear and there was a lack of clearly defined roles and responsibilities, as well as a lack of overarching strategies informing or guiding people. One of the employees felt that the culture of the organisation was also a resisting factor in implementing the innovation and said: *"I believe that our internal culture of making someone else responsible for something is very evident at the moment. Processes are discarded and changed by anyone and everyone, as it suits them to achieve their goals. All the members of the IT Management Committee level should familiarize themselves with King III. So that they can discreetly, look at compliance issues. It is not that people are not aware of things, it's a cultural issue that we have at the moment* (RL05, p42:1420-1425)".

Evidently, resistance to innovation can be observed even at IT senior management level.

Findings showed that some employees used the IT governance frameworks to a lesser extent as they were unsure about the innovation, while those who

wanted to determine the usefulness of IT governance frameworks opted to seek further information. One of the interviewees opined: "*For IT governance framework to be implemented, knowledge of the subject is required and awareness of the existing policy is necessary* (RL06, p50:1705-1709)".

Thus, it requires every participating employee to understand the content of the policies relating to their involvement and expertise. Lack of awareness had a negative impact on the implementation of IT governance frameworks in the organisation. Lack of understanding and awareness seemed to be prevalent and a growing concern among the employees, which manifested in uncertainty about how the IT governance framework should be managed in the organisation. One of the interviewees expressed his view as follows: "*I need to familiarise myself with these frameworks. I need to understand what they do. What is its objective? What is it trying to achieve? What are the contents of the framework, and then at this point I am not in a position to do that. As soon as that is understood about the framework, it gives you a clear indication of the role players (*RL07, p60:2063-2065)".

The implementation of the IT governance framework at RedLeaf Communications, was difficult, extensive and, at times, a challenging process. The implementation stage required the support of management, adequate skills and an environment where information is shared and although senior management played a pivotal role in the implementation, the lack of technical and non-technical resources impeded the implementation stage. According to one of the employees, "*…the biggest challenge is that there are no qualified resources in our organisation to implement IT governance framework (*RL00, p4:103-104)".

The implementation of IT governance framework changed the operating practices at RedLeaf Communication from both technical and non-technical resources perspectives. This had an effect on management practices and measurement of activities and processes within the IT environment. For instance one of the interviewees commented: "*We develop a lot of documents that are very big, and nobody's going to read them. If those documents are being signed-off and the people in the environment are not even aware of that, how do you expect behaviour change? There is a lack of change management when implementing new IT governance framework; this is very common in this organisation* (RL01, p10:284-287)".

This shows the involvement of change management is vital to facilitate and encourage employees to adopt an innovation within an organisation. In the opinion of one of the employees, "*… these IT governance frameworks are a collection of years of best practices, researched in different countries by different organisations put together over years* (RL06, p55:1898-1901)".

In analysing the data using the implementation component of the innovation process, findings showed organisational culture, attitude and resistance to change as some of the factors which influenced implementation of the IT governance framework at RedLeaf Communications.

4.5. Innovation Decision Process: Confirmation

Implementation of the IT governance frameworks was confirmed by all stakeholders involved. Confirmation entails signing-off of the IT governance framework's documentation by relevant stakeholders of RedLeaf Communications from both IT and business units, and at strategic (management) and operational (rest of the employees) levels. Confirmation (sign-off) by management was to legitimise the adoption and implementation of IT governance frameworks in the organisation.

Confirming implementation of IT governance frameworks allowed and encouraged employees to further explore tangible and intangible benefits of IT in the organisation. In the views of two interviewees: "O*nce the IT governance framework was adopted, one needs to align them to your company's objectives to derive value from them and that is where the value of IT governance frameworks are realised* (RL03, p33:1077-1081) "; "*IT governance framework brings transparency to the organisation, accountability in decision making, adding value to business, and optimises the use of resources* (RL01, p18:571-573)".

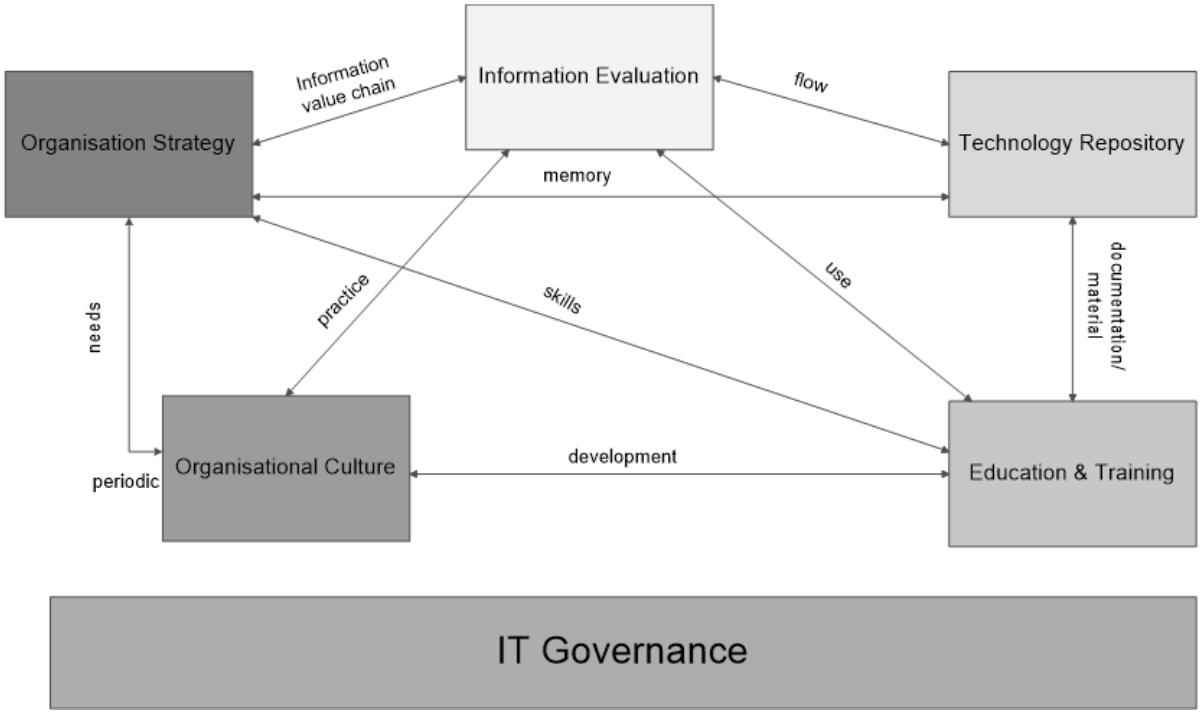
This led to employees evaluating their decision to continue or discontinue the use and management of the selected IT governance frameworks. An employee in the organisation find it challenging and stated the following: "*Questioning how and where IT governance frameworks selection, deployment and management were initiated, to which extent it will be interrogated to confirm that it follows certain processes is lacking* (RL06, p56:1924-1925)".

A lack of mechanism to enforce the innovation during the implementation stage may lead to employees abandoning it, either by using it less and less or by completely discarding it. Furthermore, as employees were not completely committed to the processes and procedures that had been implemented by the organisation's top management, these needed to be enforced. In the view of one of the employees, "*Defined processes, guidelines and policies are in place, but when it comes to the operationalization or implementation they need to be enforced. If they are not enforced and there is no accountability in that regard then IT governance frameworks are not used* (RL06, p46:1551-1553)".

5. IT GOVERNANCE: AN ARCHITECTURAL FRAMEWORK BASED ON CONSOLIDATED BEST PRACTICES

From the data analysis, through the DoI lens of Innovation Decision Process, as presented above, some critical factors that influenced and impacted the selection, implementation and management of the IT governance framework at RedLeaf Communications were revealed. The factors include *evaluation of information, technology repository, education and training, organisational strategy* and *organisational culture.* Shown in Figure 1 below, these factors are interrelated, meaning that they collectively influence and impact the selection, implementation and management of IT governance. Some of the factors are components of existing best practice frameworks. Based on the finding an Architectural Framework which is based on consolidated best practices was developed.

Figure 1. Framework for IT Governance Implementation



5.1. Evaluation of Information

Information is an important, valuable and determining factor in making a decision to select, implement and manage an IT governance framework. What was significant at RedLeaf Communications however, was how information was accessed, shared, and understood among the employees, including the management of the organisation.

The decisions which influenced and impacted the selection, implementation and management of IT governance were based on individuals' and groups' understanding and evaluation of available information, which was subjective. Based on how employees accessed, shared, interpreted and understood information relating to IT governance. Also, the information lost its originality and changed as it flowed from one individual or group to another.

The information was not evaluated against any set of criteria or requirements, which could be one of the reasons for the lack of buy-in by some of the employees, who had no terms of reference or empirical evidence which they could associate with the decisions to select and implement a particular IT governance framework. As a result, they had no confidence in the selection and implementation of the IT governance in the organisation.

It is of utmost important to evaluate information which has a serious impact on an organisation, such as the selection and implementation of IT governance, against requirements or criteria. In the context of IT governance, relevant information regarding the necessary criteria could be stored in a repository that is enabled and supported by technology. This will create reliability and uniformity, as well as a knowledge hub in the organisation.

5.2. Technology Repository

A technology repository provides a central platform to store, retrieve, access and manage information. A repository can be used as a hub to stock of knowledge and to enable information control in the organisation. Thus, it provides employees with a quick and easy platform to access, share, and distribute information. A repository also provides a platform to safeguard the organisation's information. Without a repository, information would be dispersed and the organisation would have difficulty to distribute information about IT governance frameworks. A repository increases accessibility and interest to knowledge sharing on important issues, such as IT governance frameworks in the organisation.

With a repository, there would be fewer channels through which information and changes about IT governance frameworks are communicated. This would reduce the risk of information becoming altered as it moves from person to person. A repository as a central platform where the organisation can store training material about the IT governance framework can be used and reused for education and training of all stakeholders, including newly employed staff.

5.3. Education and Training

Educating and training stakeholders on IT governance is instrumental to the success or failure of its selection, implementation and management. An important strategy to successful, implement and manage IT governance frameworks in this organisation was training. Management and employees required knowledge and skills in order to understand their decision making process, and to carry out their roles and responsibilities in selecting, deploying and managing these IT governance frameworks. Such knowledge and skills were

acquired from on-going education and training. Without it, they would have lost touch with the rapidly evolving and changing IT governance issues, which would have had an impact on the success of the implementation.

Adequate and on-going education and training assisted the organisation's employees to acquire the required skills, knowledge and ability to implement and deploy the IT governance framework. At RedLeaf Communications management had ensured that the relevant stakeholders were trained on the IT governance frameworks, therefore eliminating any lack of expertise strengthening their skill and knowledge base on IT governance frameworks. Neglecting to train employees would have resulted in employees having limited or no skill and knowledge on IT governance frameworks. Also, these employees would not have the ability to deploy and implement the frameworks. Furthermore, contrasting skills and knowledge on IT governance frameworks would have led to different deployment and implementation approaches of frameworks. Education and training formed part of the organisational strategy in pursuing and achieving the goals and objectives of the organisation, from an IT governance perspective.

5.4. Organisational Strategy

Organisational strategy has become one of the most crucial parts of an organisation's operations. However, despite its importance, strategy supportive structures and resources had not been given the attention they required to implement innovations such as IT governance frameworks. Creating structures that will support the strategy by allocating adequate technical and non-technical resources such as IT infrastructure (hardware and software), processes and people will facilitate IT governance frameworks implementation strategy.

At RedLeaf Communications people had the knowledge to select IT governance frameworks and the skill to implement and deploy the necessary IT infrastructure and processes. Successful implementation, however, depends on an effective organisational strategy. Factors such as lack of top management support for the strategy and functional structures and lack of support and direction in the implementation and deployment of the IT governance frameworks were observed by some participants. Failure to select and deploy IT governance frameworks that support the organisation's strategic objectives and lack of organisational structure to support the strategy led to factors such as lack of interest by employees, unawareness of the process and criteria employed to select and adopt IT governance frameworks, unawareness of selected IT governance frameworks selected, resistance to embrace innovation. Other potential factors to the organisation as a whole could be lost opportunities, duplicated efforts, incompatibility of systems, lack of risk management, project failures, and wasted resources.

Some of these negative factors were the norm in the organisation and the employees were of the opinion that unless the IT strategy is well articulated and aligned to organisational strategy, these negative factors will remain on the radar of the organisation. Norms and beliefs are said to be part of an organisation's culture.

5.5. Organisational Culture

One of the most important and most often discounted aspects of innovation is organisational culture. Organisational culture generally applies to the ways and norms of doing things. Culture is made up of shared values, beliefs, ethical standards and behavioural norms, ingrained attitudes, accepted work practices and styles of operating. An organisational culture can be health or unhealthy. For RedLeaf Communications a healthy culture would have had a positive impact on selecting IT governance frameworks which would contribute to achieving the organisation's strategic objectives. In addition, it would have created an environment that supportive, adaptable and embrace innovation such as the adoption of IT governance frameworks.

However, the organisational culture at RedLeaf Communications was unhealthy, thus failing to seize the advantages and opportunities that IT governance frameworks offer. In addition, RedLeaf Communications minimizes the adopted IT governance frameworks to a set of unused IT tools or standards. Employees developed negative attitudes towards the frameworks and therefore resisted the implementation and deployment thereof. These findings showed that lack of support and direction from top management demotivated the employees, thus resulting in their reluctance to adopt and adapt the frameworks.

6. CONCLUSION

In conclusion, this study develops a best practice architectural framework by pulling together research from various IT best practices and comparing and contrasting their attributes. The study also develops an understanding on how organisations select and adopt best practice frameworks for their needs. The benefits of the studies are twofold. First, it contributes to the body of knowledge, in that it adds to available literature in the area of IT governance. Second, to organisations, in particular the organisation that was used as case study in the study.

From the perspective of body of knowledge, the contributions come from both theoretical and practical viewpoints. Theoretically, the research enhances the body of knowledge with regards to the influence of IT governance frameworks in an IT organisational setting for the management of IT governance. This research contributes to the body of knowledge of prevailing literature on IT governance, frameworks and standards for IT governance and innovation. The practical contribution of this study is the comprehensive work that underlines the frameworks presented in Figure 1. The researcher acknowledges that professionals are not expected to process the entire study to attain an understanding of this applied contribution in order to apply it in their settings.

The architectural framework developed in the study can be employed to select and implement IT governance frameworks in an organisational setting. The architectural framework explains how IT governance frameworks can be implemented through different architectural concepts. In addition, it underpins the importance of the organisational strategy, culture, people, process and management (leadership) guidance and support in the selection and implementation of IT governance frameworks. This study can assist boards of directors, top

managers and non-managers in organisations to better comprehend the factors which are influenced the selection, implementation and management of IT governance frameworks.

Another benefit of the article is its empirical reveal, that IT governance cannot be studied in isolation from the organisational contexts in which it is developed and implemented. Organisational and IT strategies are the underpinning concepts from which IT governance emanate. It would therefore be worthwhile to employ the Framework presented in this article to guide selection and implementation of IT governance frameworks. This article is intended to benefit senior management and directors involved in implementing IT governance to help them select and adopt best practices that will address their organisational needs. These aspects will make a substantive contribution to research on the selection and adoption of best practice-based frameworks for the implementation of effective IT governance. It is envisioned that an active process to select strategically suitable best practices framework or a combination of them will encourage practices that are consistent with an organisation's strategy and culture.

Although authors of corporate and academic literature are explicit about the roles and responsibilities of IT governance in public and private organisations, the accountability lines are still blurred for many organisations. A further research in the area, to examine and understand the sources of power in organisation, and how the different types of power are used and how they might influence the way people associate with one another in carrying out their individual and group roles and responsibilities in the implementation of IT governance frameworks in the organisation.

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