An Inquiry into IT Governance in Healthcare Organizations in Uganda

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Abstract. Looking at the world today, various organizations have taken up IT to support most of their work processes. IT can no longer be considered only a support component but has become strategic. Given that IT is ubiquitous, it requires proper governance in order for organizations to derive value and achieve organizational objectives from its use. IT governance is therefore advocated as a necessary means for ensuring the effective and efficient use of IT. Previous literature does not say much about IT governance adoption and enactment in healthcare organizations. In this study, resource orchestration is used as a framework for understanding management strategies for IT governance adoption in healthcare organizations. The study answers the research question, "How are managerial strategies impacting the adoption of IT governance in healthcare organizations". This was done through an interview study of managers, IT workers and policy makers in select Ugandan organizations. The participants in the study were from the private and public healthcare organizations, IT authority and the capital city authority. Findings show that there are informally agreed upon and approved strategies in place for the adoption of IT governance. The contribution is in terms of suggestions of how senior management can enact the strategies and make use of the organization's knowledge based and financial resources to inform adoption of IT governance.

Keywords: IT Governance, Resource Orchestration, Healthcare.

1 Introduction

Information Technology (IT) is now ubiquitous in many organizations and is increasingly considered a strategic resource. IT has played a key role in transforming various industries leading to new business models [1,2]. IT initiatives rely on funding approved by senior management but at the same time suffer from the limited knowledge of IT investment processes by senior management [3]. IT is seen as an enabler in the effort to attain improved efficiency in the services offered in healthcare [4].

Over the years there has been a growing need to provide high quality health services at affordable cost as well as easier access to medical information for the patients. As a result, hospitals have turned to or are turning to IT to find solutions to these requirements [5,6]. Most of the hospitals that have embraced IT have implemented integrated IT applications that cut across many functions [7]. The growing trend of moving from the traditional healthcare to what is referred to as ehealth has stimulated some debates leading to research focusing on the role IT plays in improving efficiency in healthcare [8].

There has been a notable increase of IT complexity in healthcare organizations [9] which adds to the need for IT governance in these organizations. The increasing level of IT investment and the expected impact on the performance of healthcare organizations demands an active governance stance [10]. There is not much in the previous literature specifically giving information about the state of IT governance in healthcare organizations in developing countries. The definition of control enactment by Wiener [25], gives the motivation for this study in order to understand the interaction between the senior management and those they lead. The aim of this study is to explore the state of IT governance in healthcare organizations in Uganda.

In order to get value from IT governance, board members in organizations should ensure management and organizational structures and processes that sustain the organization's IT in order to extend the organization's strategy and objective [11]. The enactment of control [25] by the board members can potentially realize the desired goals by influencing senior management. In the same vein, the resource orchestration perspective was used to study IT governance in healthcare organizations

This empirical study was done in select public and private healthcare organizations in order to answer the following research question: "*How are the managerial strategies impacting the adoption of IT governance in healthcare organizations*?"

The contribution of this study offers an understanding of the strategies in healthcare organizations to support IT governance. The rest of the paper is organized as follows; section 2 discusses the relevance of IT governance and describes the theoretical lens. Section 3 describes the method, empirical description of case, data collection and analysis. Section 4 presents the findings and section 5 has the discussion. Section 6 has the implications for research and practices, and section 7 presents the conclusion.

2 The relevance of IT Governance in Healthcare

Healthcare is paramount to a population's wellbeing and as such becomes a complex industry. There are many ways in which IT can be used to improve the efficiency in healthcare like in the areas of electronic health records (EHR), sharing of patient records and so on. In order to realize efficiency in healthcare using IT as an enabler of the business, requires acquiring new infrastructure among other things. This then points to IT investment and the realization of IT business value.

There is need for emphasis on the transparency and effective governance of IT. What is necessary to achieve this is not getting IT right but rather managing the process.

There are various definitions for IT governance [12,15,16] and for this study, the definitions by [13] and [14] are adopted, since they give a precise meaning of IT governance. Van Grembergen [13] defines IT governance as "the organizational capacity exercised by the board, executive management and IT management to control the formulation and implementation of IT strategy and in this way ensure the fusion of business and IT". Peterson [14] defines IT governance as "the distribution of IT decision making rights and responsibilities among enterprise stakeholders, and the procedures

and mechanisms for making and monitoring strategic decisions regarding IT". The IT governance framework is made up of structures, processes and relational mechanisms as depicted in Fig.1. adapted from De Haes and Van Grembergen [15].

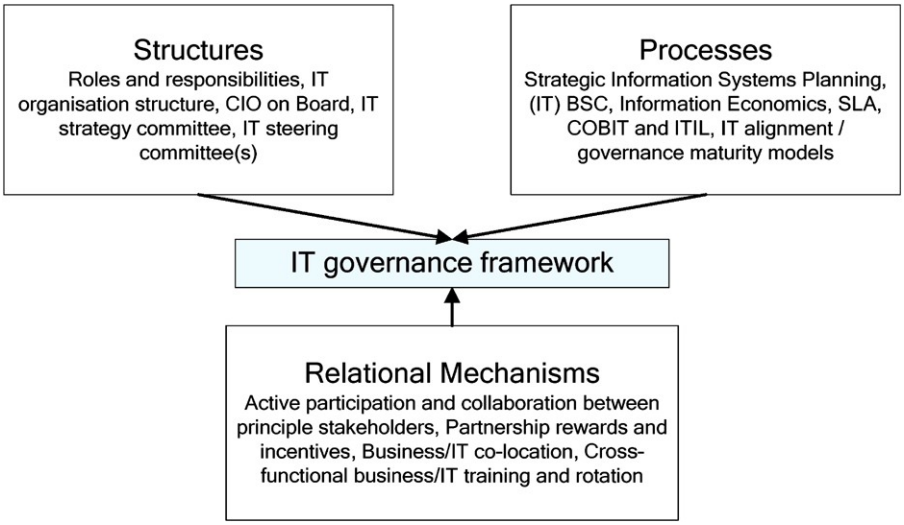

Fig.1. Element of IT governance Framework adapted from De Haes and Van Grembergen (2006)

2.1 Structures: Roles and responsibilities and IT department

IT governance has been prevalent in three modes over the years, namely; the centralized IT governance modes, the decentralized IT governance mode and the organizational IT governance mode.

The centralized IT governance mode is about the corporate IS taking on responsibility to deal with the infrastructure, its use and project management. The main thing in this mode is the business strategy since there is no IT strategy. It is referred to as a business monarchy [15], where the IT department does not act independently of senior management.

The decentralized IT governance mode is about the divisional IS and line management taking on authority. The authority can be played differently for IT [16]. There is localization of governance rights with each business leader who acts autonomously depending on the needs and with his own budget [15].

The organizational IT governance mode bundles both the corporate IS and the business units and undertakes the responsibility for the IT activities [17,18,19]. This approach makes use of the multi skilled teams and cross functional liaison with the developed strategy. This makes the formulation, analysis and implementation a more fluid process [20].

There is diversity in the choice of approaches mentioned above since organizations are different. In order to manage the required change, IT governance requires the implementation of structures. The success of these structures lies in the ownership of the

stakeholders involved. The new governance structures need to come along with better costs, results, and lower risks.

The purpose of IT governance is to manage and achieve structures that are core to business success and trust by the board in order to realize the strategic goals in a competitive manner. This involves the management team having control over cost and investment alongside accountability as well as maximizing the capability of the IT selected to provide support to the clinicians and administrators in a hospital. When all the stakeholders are working together, there is trust and ownership of the structure and its related process [21].

2.2 Processes: Planning and monitoring

In the earlier days, as a requirement for IT governance, each business had to identify and establish its own procedures and processes in order to manage the flow of information related to the initial proposals, business plans, documentation and approval processes for IT investments [15]. IT governance has been guided by the gating process over the years while handling projects. Lately, there had been development of various frameworks like COBIT, ITIL among others that are being used in the implementation of IT governance [17]. All these available frameworks today aim at having the projects realize the organization's strategy.

2.3 Relational mechanisms: Role of IT departments and the frameworks

The type of the organizational setting will determine the success of the mechanisms which also depends on the governance approach taken on by the organization. The mechanisms go a long way in facilitating collaboration and cross function business/IT training. This is helpful in that if we have an expert whose powers are seemingly being usurped due to the new structures as pointed out earlier, so that we can have mediation through these relational mechanisms to help avert such scenarios.

The IT department in conjunction with the human resources department is central in the implementation of the strategic IT management across the organization. In order for the IT department to handle this well, it requires frameworks which were discussed earlier in subsection [2.2]. People are key to attaining integrative effort and therefore must be trained to make the lateral dimension their focus [22]. With the relational mechanisms in place, the focus now remains on how to effectively manage IT governance and also sensitizing the stakeholders on the deployment of the methodologies.

The next section describes the theoretical lens to help understand the IT governance practices in healthcare organizations in Uganda.

2.4 The resource orchestration framework

The resource orchestration framework (ROF) [22] is used as an analytical lens to explore how healthcare organizations are adopting IT governance. The ROF has three main components that can potentially support control enactment in healthcare organization as they work to adopt IT governance.

The ROF (Fig. 2) addresses issues not previous considered and these include the organizational breadth (scope of the organization), depth (managerial levels within the organization) and the life cycle. The empirical study was done amongst some of the healthcare organizations in Uganda focusing on the managerial levels in the organizations and how they affect resource orchestration actions during the realization of IT governance.

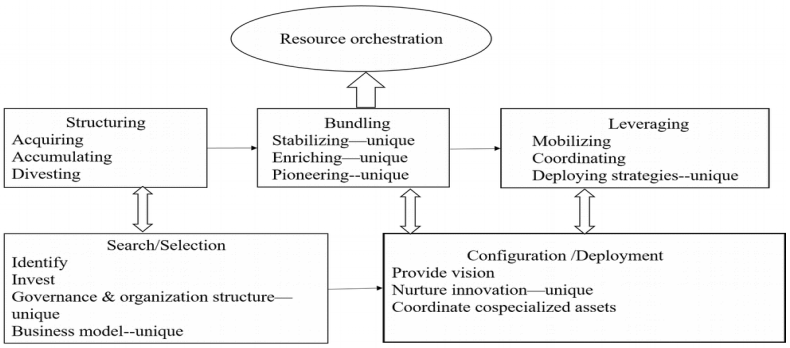

Fig. 1. The resource orchestration framework (Adapted from Sirmon et al. 2011)

3 Method

3.1 Empirical selection and description of case

The study was conducted mainly in Kampala, the capital city of Uganda, which is in the central region. Uganda is among the developing countries trying to adopt the use of IT in many areas including healthcare. Healthcare organizations have adopted the use IT in the form of health information systems and mobile apps. This has brought about some disruption which calls for IT governance in order to realize value for the IT Investments. Interviews were also done in the eastern region of Uganda in Mbale at the regional referral hospital and the western region of Uganda in Fortportal at the regional referral hospital. The choice of Kampala hospitals was mainly because they are private hospitals considered to be with the state-of-the-art equipment and therefore use IT in their processes. In other words, the private hospitals are considered to be the pace setters. In order to get an understanding of what goes on in the public sector, the two regional referral hospitals in the east and west of the country were selected.

3.2 Data collection

Data was collected from key stakeholders who mainly included health IT professionals and administrators. In depth interviews were done with 11 informants. 4 out of the 11 informants were administrators who advise senior management on key IT investment decisions while others are policy makers, and the rest of the informants were health IT professionals. The interviews were around issues of governance of IT in healthcare and lasted between 45- 60 minutes. The intention was to explore how ad-

ministrators and IT professionals enact IT governance in their organizations and whether there is a national IT governance plan for healthcare.

In addition to interviews, secondary data was collected from websites and documentation shared by some of the informants. Those interviewed were requested to suggest other potential interviewees as external interviewers can have difficulty in identifying the right informants.

Table 1. Informants interviewed showing organizations they work for and their designations

Organisation	Designation of person interviewed
Uganda Catholic Medical Bureau	Head IT
Nsambya Home care	IT Manager
Nsambya Hospital	Systems Administrator
Rubaga Hospital	IT Head
Kampala Capital City Authority	Manager Medical Services
Mbale Regional Referral Hospital	IT Officer
Fortportal Regional Referral Hospital	IT Officer
International Hospital Kampala	IT Head
Ministry of Health	Commissioner
National Information Technology Authority of Uganda	Director e-government services
National Information Technology Authority of Uganda	Health Lead

3.3 Method of Analysis

For the analysis, themes were developed using the ROF. Systematic coding across the data set was done and this helped in coming up with the initial codes. Using the ROF, the following categories emerged; coordinating, enriching, pioneering, acquiring, accumulating, nurturing of innovation and divesting of resources. Repeatedly listening to the transcribed interviews and interview notes helped in developing the results as viewed from the resource orchestration lens.

4 Results

In this section, the findings are presented using some components of ROF.

4.1 Structuring

Most of the healthcare organizations that participated in the study are in the process of acquiring and improving their IT infrastructure. There are minor improvements on existing infrastructure (accumulating). Some have divested both the software and hard-

ware and have new software and hardware that suits the requirements of the organizations.

Many of the healthcare organizations are using the rudimentary method of recording patient records in books and on cards. This has its own issues of privacy of the patients' records and at the same time the patients may lose their books, which means that at each visit they have no records. This makes it hard to do a good assessment of the patient. Subsequently, these and other issues have led to the adoption of IT by implementing Health Information systems (HIS). Table 2 below shows some of the systems in use in both private and public hospitals and whether they are standalone or integrated in the various organizations.

Table 2: Showing the IT systems available and whether they are standalone or integrated

Organization	Types of Systems	Integrated/ Standalone
Alpha	Electronic Patient Record (EHR), Radiology, Billing, Pharmacy	Over 50% Integrated
Omega	Hospital Management System (HMIS), Lab System, Billing	Heterogeneous integrated systems
Beta	Uganda Electronic Medical Record (UgEMR), Pharmacy and Lab system,	Standalone
Nano	Billing, Pharmacy and Lab, Patient records	30% Integrated
Gamma	District Health Information Systems (DHIS2), UgEMR, HMIS	Standalone

* Pseudo names are used for the names of the organizations in the table

The table above shows the IT systems available in the hospitals. Most of them are standalone. This probably shows that the IT value from the systems is not yet optimal. There is need for complete integration, which requires support from the board to fund the IT budget as stated by one of the health IT staff: "*The board approved the integration of Clinic Master with the ERP system currently in use. This is one way of aligning the IT with the business to realize value for the IT investment and the strategic objectives of the organization*."

In order to realize smooth sharing of information among the existing standalone systems, the necessary infrastructure and software have to be procured. Training of both the IT staff and the end users should take place after the implementation. This requires a lot of support from senior management and the board. One of the IT staff

stated that: "*There are many challenges as we move towards realization of the integration process and these include, infrastructural changes, bureaucracy in getting new infrastructure, non-IT savvy clinicians and insufficient training for both IT staff and end users.*"

Generally, structuring is happening mainly in the private hospitals where the management at all levels is keen to support the use of IT. As for the public hospitals, they are still tied to DHIS2 which focuses on aggregate data from all districts in the country. This clearly shows the need for an IT infrastructure procurement plan for health information systems in health centres at all levels in the country. Speaking to an IT officer at a regional referral hospital, he stated: '*In the current state, we have no IT team, we rely on services of the outsourced IT company. This is mainly because we literally have no IT network in place. There are just a few standalone computers that are used for various tasks in the hospital.*'

In the private hospitals, the board and senior management have given the necessary support by approving the roll out of the health information system to the entire network of clinics. The customized HMIS is operational at the Nano headquarters and will be rolled out to the clinics network in a year's time.

4.2 Bundling

The integration of resources to achieve improvements to existing capabilities as well as extending and creating of new capabilities is evident. In one of the private not for profit (PNFP) hospitals, there is an ongoing effort to improve the existing capabilities of the health information system (HIS). In its current state, it serves only the clinicians and the top management. The IT support staff stated that: '*Streamline was designed by the doctors and they did not involve other stakeholders like patients. In terms of performance, it is good for the doctors but not good for the patients.*'

The IT support staff advised top management that it is imperative that the existing HIS be modified to involve and serve all stakeholders. This was work in progress and should be operational now.

In the case of public hospitals (state owned) the ministry has embarked on enriching the current capabilities by adding the health management information system (HMIS). However, for this to happen there must be an appropriate governance structure and infrastructure in place. In support of this the Commissioner in the ministry of health stated: '*There are different patient information systems that don't 'talk' to each other. For proper system integration, there is need for a national health facility master list that is coded, infrastructure that can facilitate the use of systems at the health centre level and regional referral hospitals. Ultimately, an appropriate governance structure is necessary.*'

At the Nano hospital which is private, efforts are underway to do minor improvements to existing capabilities. This is through the upgrading of their customized HISs after acquiring better hardware and software. The IT manager at Nano hospital stated that: '*Originally the hospital (headquarters) was using Navisionattain ver 3.6 and has now upgraded to MS Dynamics Nav 2016 (ERP) which had been customized to*

include patient handling. The clinics still use Navisionattain but Nav 2016 will be rolled out in a year's time.'

At Omega hospital, bundling efforts have met challenges that include bureaucracy in the procurement of IT infrastructure, clinicians that are not IT savvy, insufficient training of staff both clinical and IT in regard to IT systems and the security of patient records. The IT officer at Omega stated: '*As the IT team we advise management on what needs to be in place to improve the efficiency of the systems in place. They have been supportive and approve our requests. The challenge though is that the procurement takes ages and so affects the entire process. After implementation of the new systems, only a few IT and clinical staff are trained to handle the new systems. This affects the systems performance as it will not work at its optimal level.'*

At the Alpha hospital, they have ClinicMaster for the patient records and Navision to handle the accounts and inventory. The hospital director requested that there is seamless flow of information between the two systems. The project to do the integration of the two systems is underway and was midway as stated by the IT officer at Alpha Hospital: '*The hospital management in the bid to realize improved efficiency run to IT in the form of a HIS. The outcome was procurement of ClinicMaster and Navision. After a while management requested for the integration of the two systems. The project was approved and is now close to completion.'*

Overall there is a drive to improve the existing capabilities as well as creating new capabilities in most of the private hospitals as a way to tap into IT.

4.3 Leveraging

There are practical issues and managerial strategies that are in place to realize efficiency from the use of IT. Most of the private hospitals' boards and senior management have projects in place and are willing to support them to succeed. They monitor the progress of the projects as part of their roles. This was evident at the Alpha hospital where the IT officer stated: '*The board and senior management agreed on financing a project to realize the integration of ClinicMaster and Navision. The objective for this was to have seamless flow of information between the two systems. This is expected to improve the efficiency of the hospital as they serve their clients.*'

The IT manager at Nano hospital stated that there are no IT governance structures. However, he added that there was an IT audit report which recommended among other things the deployment of IT governance tools and implementation of IT projects in a timely manner. The IT manager at Nano hospital stated: '*At the moment we don't use any IT governance frameworks but these are planned for after the audit. These are some of the recommendations following the IT audit. The board takes keen interest in the recommendations made and oversees their implementation.'*

Beta home care which is part of Omega hospital is looking to fully use the UgandaEMR system in order to track and monitor patients in any part of the country. The UgandaEMR is a medical records system that is in use in over 340 sites in Uganda and mainly deals with HIV treatment. The Beta home care being an HIV treatment centre is keen to make the most of the UgandaEMR as stated by their IT officer: '*In collaboration with development partners, we are in the process of having Ugan-*

daEMR to help us in the monitoring of the following aspects of the patients; demographics, vitals for the patient and viral loads. With UgandaEMR we will be able to track patients in any part of the country.'

In the current state, there are literally no HISs in the public hospitals. The Ministry of Health (MoH) relies on information from the DHIS2 that is provided by the district health Officers (DHOs). The DHIS2 Tracker is an addition to the DHIS2 platform and is mainly for sharing critical clinical health data across multiple health facilities. However, if it is to be used at a national level as an HIS for the case of MoH, it has to be combined with more advanced electronic medical records as stated on the DHIS2 website: '*The aim of the DHIS2 tracker is not to become an advanced electronic medical record system to support clinical care, but to be a basic transactional system easy to set up and that it builds on an existing and proven platform with available technical capacity.'*

Typically, there are efforts in hospitals involving a sequence of processes that shall lead to the use of IT to improve service delivery in hospitals.

5 Discussion

The research findings show that the various managerial levels are not supporting each other as they seem to have different agendas. Synchronization of the resource orchestration actions is important if value for IT investment is to be realized. According to [23], there is need for senior management to be involved concurrently at all stages of the process of resource management, and at the same time consistently scanning the outside surroundings for relevant prompts about change.

A majority of respondents stated that their organizations did not have a clear IT governance structure in place e.g. IT steering committees, IT strategy committees, COBIT, ITIL, etc. Based on the responses it seemed like some of these things were on paper but not implemented. Furthermore, due to the unclear IT strategy, the IT structures and processes (Fig.1) are not clear or nonexistent in many of the healthcare organizations. Again, IT outsourcing in the public health care organizations, affected the IT investments decisions. Without IT structures and unclear IT processes in place, it is a barrier to effective IT governance [24].

Healthcare access is still low given the number of health centres and regional referral hospitals in place vis-a-vis the population. Public health facilities are deficient of drugs and basic equipment to do diagnosis and laboratory tests. The use of IT is extremely low and health records are written in books carried by the patients and so they can get destroyed or misplaced easily. Also, a patient can use three books each for a specific health facility in order to acquire as much available free drugs. This then does not give an accurate picture of the number of patients treated since there is a duplication. IT systems could reduce the duplication and also help develop an accurate health record of patients.

6 Implications for research and practice

The study gives insight for possible research on how value for IT investment can be realized in a setting without well-defined IT governance structures. Then in practice, how to put in place an effective EHR could provide accurate information of patients who move from health facility to facility in terms of diagnosis and prescription. In conjunction with MoH also come up with an IT system that can be used to monitor the distribution of drugs between the national drug authority and the hospitals.

7 Conclusion

The state of IT governance (ITG) in healthcare organizations in Uganda has been noted as below par. Many of the healthcare organizations have it on paper and have never gone an extra mile to do the implementation. Having ITG mechanisms in healthcare organizations could support the adoption of IT in healthcare organizations. Managerial teams in healthcare organizations need to support the development of electronic health records (EHR) that can be shared amongst both the private and public healthcare organizations. EHRs could bring into play, storage of accurate information about the patients in terms of diagnosis and prescription. The study showed that in the private hospitals, all the managerial levels (top, middle and operational) are involved in the IT investment decisions which follows the hierarchy until a final decision is taken. Other benefits could be improvements in the areas of IT strategy planning and formation which could in turn lead to improved IT governance structures. Finally, with proper IT governance structures in place, there is likely to be easier IT adoption in healthcare organizations leading to better and improved healthcare service delivery.

8 Acknowledgement

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