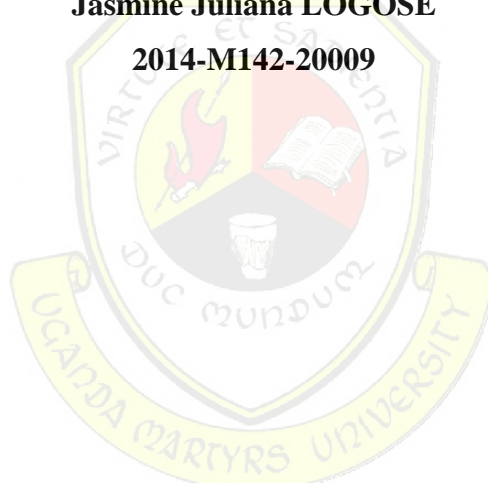**Framework for Successful Implementation and Use of Information Systems in Organisations.**

Case Study: The Ministry of Heath - Uganda

Jasmine Juliana LOGOSE

2014-M142-20009

Uganda Martyrs University

October 2016

Framework for Successful Implementation and Use of Information Systems

in Organisations.

Case Study: The Ministry of Heath - Uganda

A postgraduate dissertation

presented to

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the award of the degree

Master of Science in ICT Management, Policy and Architectural design

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Jasmine Juliana LOGOSE

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DEDICATION

I dedicate this book to my son Zen Uhuru,

My parents,

And my siblings: Jenifer, Matthew, Aaron, Jude, Mercy, Emmanuel, Patience and Pius.

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LIST OF ABBREVIATIONS

ERPs: Enterprise Resource Planning Systems

HC: Health Centre

HR: Human Resource

ID: Innovation Diffusion

IFMS: Integrated Financial Management System

iHRIS: integrated Human Resource Information System

IPPS: Integrated Personnel and Payroll System

IS: Information System

IT: Information Technology

MoH: Ministry of Health, Uganda

PC: Personal Computer

PMBOK: Project Management Body of Knowledge

SCT: Socio Cognitive Theory

TAM: Technology Acceptance Model

TOGAF: The Open Group Architecture Framework

TPB: Theory of Planned Behavior

UTAUT: Unified Theory Acceptance and Use of Technology

VHT: Village Health Team

ABSTRACT

This study was about the development of a framework for successful implementation and use of Information Systems in organisations. It involved reviewing literature on the challenges that organisations are facing in the implementation and use of information systems. It also involved a review of the different IS implementation and use approaches that are currently in use. Questionnaires, interviews and focus group discussions were used to collect data. To analyze the collected data Colaizzi's (1978) framework for data analysis was used. The Ministry of Health, Uganda was considered as a case study with specific focus of the integrated Human Resource Information System (iHRIS). The analysis results indicated that MoH faces a number of challenges in the implementation and utilization of information systems. These challenges include; lack of a clear IS implementation methodology, inadequate computer skills among staff, limited stakeholder involvement, disunity and power wars and a presence of similar system among others.

Based on the findings of this study, an implementation and use framework for organisations was developed. The developed framework is an extension of Statnikova's (2005) IT implementation model. The different stages of Statnikova's model were improved using constructs adopted from other implementation and use approaches including, Lewin's change model, Diffusion of Innovations theory, TAM, TPB, UTAUT, TOGAF, IS Success model and other studies. Although the developed model is expected to help organisations realize maximum value out of there IS investments, there is need for the framework to be validated in a live environment and within multiple organisational contexts. Also the area of IS use is still in a young phase. Thus more research still needs to be carried out in these areas with emphasis on Uganda and other developing countries.

CHAPTER ONE

GENERAL INTRODUCTION

1.0 Introduction

In the information age, implementation and use of Information Systems (IS) is a strategy that many organisations have adopted with the aim of increasing productivity and staying competitive. Globally, organisations are investing in Information Systems because they believe that accurate information can enable an organisation to remain competitive. As a result, IS are now used to run various facets of organisation functions such as finance, production, marketing, and human resource. Some IS have been successfully implemented in organisations. This means that they were finished on time, met user requirements and were within budget. However, Angelo (2014) reports that 40% of the Information System projects are not successful in meeting business requirements, experience time overruns and are abandoned. The author goes ahead to contend that 60% to 70% of the large Information system projects meet the same fate. In addition, the linkage between IS implementation, continued use and desired outcomes is still a growing concern. While the investments are costly, the level of use by different stakeholders is very low (Hwang, 2014; Angelo, 2015 & Stone, 2014). What is clear is that organisations cannot benefit from the investments in Information Systems if the implementation and use challenges are not addressed.

This study presents a framework that can be used to successfully implement and use Information Systems in organisations. It is specifically designed for organisations that intend to successfully implement and use Information Systems to achieve organisational goals and business objectives. The framework combines both implementation and use factors that contribute towards IS success. It ensures that organisations realize the desired goals/outcomes. In order to fully understand the challenges of IS implementation and use in organisations; the Ministry of Health (MoH) Uganda was identified as a case study. The choice of MOH as a case study was based on the fact that it is one of the many Government agencies, which has had limited use of the implemented Information Systems (Rwagoga & Baryayetunga, 2007; Magambo, 2011).

This chapter therefore provides an overview and preamble of the study. It presents the research background as well as the general and specific objectives of the research. It further introduces the reader to the research problem, research questions, significance and justification of the study.

1.1 Background to the Study

In order to stay competitive, organisations are incorporating Information Technology (IT) and Information Systems (IS) in every day processes (Berisha-Namani, 2010). Information Systems and Information Technology are interrelated fields (Oliveira da Silva & de Magalhaes, 1999). While Information Technology focuses on computers and the technology that supports the transmission and communication of information, Information Systems deal with the social aspects where people and business processes interact through the use of technology. Bourgeois (2014) defines Information Systems as 'interrelated components working together to collect, process, store and disseminate information to support decision-making, coordination, control, analysis, and visualization in an organisation.' Avison and Fitzgerald (2002 cited in Paul, 2002) define Information Systems as 'the effective analysis, design, delivery, and use of information for organisations and society using information technology.' In general, Information Systems are described as IT enabled business solutions.

According to Merriam-Webster English dictionary, the word '*successful*' implies producing a decided or desired result. *Implementation* is defined as 'the phase of internal strategy formation, project definition and activities in which an adopted application is introduced within the organization, with the aim of removing reservations and stimulating the optimum use of the application' (Bouman et al 2005). Burton-Jones and Grange (2011) refer to *effective Information System utilization* as, 'using a system in a way that increase achievement of the goals for using the system.' We can sum up the definitions with the words of Bouman et al. (2005) who argue that:

> '*The entire process of the adoption, implementation, use and effects of such a technology is a process of mutual interaction… This means that the use of ICT in organizations is a dynamic interaction between the process of technological innovation… and the process of organizational innovation that consists of the actual adoption and implementation of an ICT application in an organization, the use of these*

applications and the effect this has on the work and communication in the organization.'

This definition is consistent with how the introduction of Information Technologies in the organisation context should be viewed.

According to Hevner et al. (2004 cited in Kangas, 2016), Information Systems are implemented to improve efficiency and performance in organisations. They are also used to increase competitive advantage and maximize profits in terms of cost reduction, differentiation, innovativeness, growth and strategic alliance (Xu & Quaddus, 2013). To increase productivity, Information Systems have been deployed in multi-level organisations where they are used to streamline processes, facilitate managers with information for decision-making and coordination of tasks (Berisha-Namani, 2010).

Kangas (2016) points out that while the field of Information System literature is bursting with best practices and success stories, there is a distressing number of failed IS projects that should be of interest to IT managers and researchers. Globally, most IS challenges have been linked to their implementation and use in organisations. Kangas (2016) contends that IS are realised in the implementation. This is where the organisation ensures that the IS features are aligned with business and user needs. Best practices and critical factors are carefully identified and planned for before unnecessary costs are raised. If this process is not well managed, the IS implementation process will fail. Considering that over 70% of IS projects implemented in developing countries fail (Ray, 2011 cited in Baguma and Lubega, 2013), this means that there are contextual factors that are ignored by the project teams that contribute to the high rate of system failure. Heeks (2002) identifies two categories of Information System failure. Total failure where an innovation is never implemented; quickly abandoned by the users or is never operational. The other category is partial failure where the major goals are not attained and there are no significant outcomes.

Ngwenyama and Nielsen (2014) further add that weak or absent top management support is to blame for IS implementation failure. Because implementing new projects is a radical undertaking that affects the social, cultural and process structures as well as organisational behavior, it

requires top management to take the lead in influencing IS success (Chan et al. 2011). Combaz (2015) cites inadequate project teams, scope creep, mismanaged schedules and large budgets as the reason for IS failure. Other scholars have highlighted; ignoring the post-project stage such as actual system use (Govindaraju, 2012), lack of user involvement in project implementation, resistance to change and inadequate change management (Meissonier & Houze, 2010; Vaughan, n. d.). Also, Brown et al. (2002) infer to organisations where IS use is mandatory, they observe that although employees use the system, feelings towards their supervisors and loyalty to the organisation are negatively affected. As a result, employees may engage in system sabotage including intentional or unintentional destructive behaviors, which can cost the organisation. In the Uganda context, the failure of Information Systems has mainly been attributed to; a lack of coherence between the system design and the reality of the organisation context, lack of proactive user engagement during initial phases of system development and a lack of internal political desire among other challenges (Baguma and Lubega, 2013; Isabalija et al., 2011; Ssemaluulu, 2012; Ssewanyana, 2009 & Namakula & Kituyi, 2014).

From the above discussion, it is clear that Information systems implementation and use still face a number of challenges. While information systems usage can be used to achieve organisational goals, actual usage is often affected by the nature of IS implementation. Most Information Systems Implementation and use frameworks that are in use today handle aspects of implementation and use independently. This in our view could be one of the reasons why they have not been very effective in helping organisations realize value out of their Information Systems initiatives. Statnikova (2005); Kornkaew (2012); Al-Mudimigh, Zairi & Al-Mashari (2001); Munkvold (1999) and Kangas (2016) developed frameworks that are mainly focused on IS implementation. On the other hand, DeLone and McLean (2003); Davis (1989); Venkatesh and Davis (2000); Venkatesh & Bala (2008) and Park (2009), concentrated on IS usage. In spite the presence of these frameworks there are many IS failures that are directly attributed to either system implementation process or usage (Angelo 2015; Klaus & Blanton, 2010). Thus, considering the high failure rates of Information Systems in organisations, there is need to develop an integrated IS implementation and use framework.

1.2 Statement of the Problem

There is no doubt that increased use of Information Systems increases efficiency and effectiveness in organisations (Naylor & Williams, 1994; Bourgeois, 2014). However, most IS implementation projects in organisation suffer from inadequate project teams, lack of top management support, poor communication, inadequate planning and requirements shift which affect these benefits (Karanja & Ng'ang'a, 2014; Namakula & Kituyi 2014). Indeed, Information Systems in many organisations are still under utilized as a result of inadequate skills, a general lack of alignment between organisation processes and system capabilities and staff resistance to change (Klaus & Blanton, 2010; Gardstedt, Julin & Tornqvist 2013).

Considering the effect of IS implementation on usage and ultimately the effect of use on organisational goals (Watson, 2007), there is still an inconclusive research gap in many IS areas including IS investments and their productivity (Schryen, 2013). Granted, there is a presence of a number of both Information Systems implementation and utilization approaches, yet IS success is still a big problem that requires attention. Kwon and Zmud (1987 cited Statnikova 2005) developed an integrated model to address aspects of implementation and use. Even with the presence of this model, IS failure rates continue to be high. To achieve IS success, it is crucial to extend existing approaches by integrating key elements and best practices to create a framework for successful implementation and use of Information Systems in organisations

1.3 Objectives of the Study

1.3.1 Major Objective

To develop a framework for successful implementation and use of Information Systems in organisations

1.3.2 Specific Objectives

    (i)   To identify the challenges that organisations are facing in the implementation and use of Information System.

    (ii)   To review existing approaches for implementation and use of Information Systems.

    (iii)   To identify best practices for implementation and use of Information Systems.

    (iv)   To identify constructs that constitutes a framework for successful implementation and use of Information Systems.

1.4 Research Questions

     (i)   What challenges are organisations facing in the implementation and use of Information Systems?

     (ii)   What are the existing approaches for implementation and use of Information System?

     (iii)   What are the best practices for the implementation and use of Information System?

     (iv)   What constructs would constitute a framework for successful implementation and use of Information Systems.

1.5 Scope of the Study

1.5.1 Geographical Scope

The study was carried out at the Ministry of Health. It mainly focused on those organisation units that are in charge of implementation and use of Information Systems. These included; the IT unit, Quality assurance department, the Planning department and Human Resources Division. The units were considered in this study because they are directly involved in the planning, implementation, monitoring and evaluation of Information Systems in the Ministry of Health.

1.5.2 Content Scope

The study examined the challenges faced by the MoH in implementing and use of Information Systems with specific focus on the integrated Human Resource Information System (iHRIS). It also examined how the iHRIS was implemented and how it is currently utilized with a view of identifying associated gaps. Specific attention was placed on understanding how the system is currently supporting the business at MoH in relation to its goals.

1.6 Significance of the Study

Most Information Systems projects are suffering from poor system-business process alignment, poor project teams and underutilization among others. Organisations are spending over 50% of their budgets on Information Systems that are delivering only 10% of the desired benefits (McAfee, 2006 cited in Burton-Jones & Grange, 2011). This implies that organisations are not realizing serious business values out of IS investments.

Thus, this research is important to all organisations that are implementing and using Information systems. The framework that has been developed in this study can be used to understand Information Systems implementation and Use challenges in organisations. Further, IS implementers in government and the private sector will benefit from this integrated IS implementation and use approach that can be used to deploy new systems in organisations.

The different users of the system will benefit from this research since it helps them to understand how to relate to new systems and address key Information System use challenges. Indeed, Managers will be able to deal with different problems that affect the implementation process and actual use of these investments.

This study is one of the few academic researches that examines the successful implementation and usage of Information Systems in organisations in Uganda as a case study. Therefore, it extends the body of knowledge in this research area. In addition, other researchers may use the findings of this research to further study Information System implementation and usage within organisations.

1.7 Justification of the Study

> *'In order for the discipline principally concerned with the IS to grow and prosper in the future, researchers ought to be (re-) developing other historical areas of the landscape: usage, adaptation, processes, and IT itself' (Berskerville, 2013).*

According to Berskerville (2013), the field of IS research still needs to grow. Important to note is that implementation and use of Information Systems in organisations continues to increase (Petter, Delone & Mclean, 2008). However, in spite the increased adoption, organisations find challenges in profiting from IS investments (Karim, 2011; Banerji, 2013). Most IS are either abandoned by users (Angelo, 2015) or underutilized when it comes to the capabilities of these technologies (Hwang, 2014). Considering the above aspects, there is need to examine the factors affecting successful implementation and utilization of Information Systems in organisations and, to develop an integrated framework that addresses the associated challenges.

1.8 Conclusion

This chapter introduced the research report by giving an overview of Information System implementation and use challenges in organisations. It details the background to the study, scope and outlines the reasons why it is important to understand the IS challenges in organisations. The significance and justification of the research have also been presented. Chapter two reviews literature related to the research problem.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

Several authors have written about Information Systems implementation and use. This chapter presents a review of literature related to Information System implementation and use. To gain a deeper understanding of the concepts under study, various literature were examine. It was also used to develop the research instruments. It is presented in sub-themes according to the objectives of the study.

2.1 Information Systems in Organisations

Organisations and Information Systems have a strong relationship with each other (Shipsey, 2010). The author notes that organisation needs have an influence on the design and implementation process of Information Systems, while Information System use affects the value of these Systems in the organisation. As such, organisations have been deploying Information Systems for many decades to manage business processes and deliver services to their clients. Today, they play an important role in enhancing communications, exchange of information and automation of various tasks within the organisation (Munirat, Sanni & Kazeem 2014).

Although most organisations use Information Systems to increase efficiency and cost effectiveness, Information Systems have also become crucial for staying in business and for competiveness. Organisations are deploying Information Systems for various reasons. Some as a form of innovativeness despite the financial benefits to the company, ambition of select groups or persons within the organisation, changes in the environment such as competition or government regulation, and others – demand by organisation tasks and processes which emphasize the need for the Information Systems (Pearlson, Saunders & Galletta, 2016; Garrison, Kim & Wakefield, 2012; Waters, Burnett & Lucas, 2009; Gable, Sedera & Chan, 2008; Ward & Peppard, 2003).

According to Bouman et al. (2005) and Pearlson, Saunders & Galletta (2015), Information System use in organisations can be categorized by their functionality. These include; information

consulting services, communication services and exchange/transactional services. Most recently, many systems have integrated all these services into a single application.

Information services: these largely rely on databases to store and retrieve data. They can be accessed via a network/Internet or directly off the server. While some information is produced for use in the organisations in the form of enterprise and management Information Systems, some information is obtained from third parties such as; financial information (stock exchange), economic (market information), legal (legal articles), scientific (complete scientific articles), government related information etc. (Bouman et al., 2005). Most information service databases are well structured and easy to access. Indeed, the increased use of the Internet in organisations has enhanced access to large volumes of information stored in various databases around the world (Ward & Peppard, 2003).

Communication services: These include applications that are either synchronous (simultaneous response) channels such as telephone calls or asynchronous (delayed interval in response) such as chat, text messages, email and voice mails (Carvalho & Ramos, 2006). Communication services can also be accessed at the same time through video conferencing systems and other electronic meetings (webinars) (Bashel & Irani, 2010; Cisco systems, 2002). Many organisations today are deploying Information Systems to enhance communication at various levels of management.

Transactional/registration services: Shipsey (2010) and Munirat, Sanni & Kazeem (2014) observe that large businesses and Governments to manage their pool of stakeholders mostly use these services. For instance Banks use the transactional services that are extended to client organisations to send or receive money. This process is often conducted electronically with minimal paperwork. The government also uses the registration services to manage the various institutions under her mandate. Internally organisations can have transactional systems that monitor different processes for example, task oriented systems, planning modules, financial administration and human resource management. Meanwhile, some systems are integrated into complex systems such as Enterprise Resource Planning systems (ERPs) (Mishra & Mishra, 2015). Also, internal registration systems can be used to supervise geographically dispersed

branch offices and processes or manage stock information or payment information centrally (Ricci, Rokach & Shapira, 2011).

Integrated applications: Information Systems are increasingly built with all the three capabilities (information, communication and transaction/registration services) (Maraghini, 2010; Monteiro, 2003). Business processes and tasks are no-longer limited to traditional patterns where each capability was administered independently (Mohamed et al. 2013). Take an example of intranets, which incorporate communication, information and registration/transactional services. One can access the organisational database online, share documents, as well as modify file information from a different location. Other instances include group decision support systems and computer supported collaborative work among others.

For this reason, the role and need for Information Systems in organisations cannot be over emphasized. However, effective implementation and continued use of these Systems often fails leaving organisations with 'wasted' investments or underutilized systems (Hwang, 2014; Angelo, 2015). Other authors note that numerous attempts at deploying Information Systems in organisations are mostly problematic due to user behavior challenges, nature of organisation and features of the technology (Abdelsalam, Reddick & ElKadi, 2012; Mishra & Mishra, 2015).

2.2 Challenges of Information System Implementation and Use in organisations

Information Systems face many challenges and shortfalls that affect their implementation and use in organisations. Angelo (2015) argues that IS project failures are not a result of technical failures but rather, social and business related problems. Garg (2010 cited in Angelo, 2015) studied IS project failure in organisations and found twenty (20) frequent failure factors. One must admit that 20, is a large number of common failure factors that need to be addressed. In this study, Garg found that lack of or inadequate top management support contributed about 95% of IS failures, 88% of the failed projects lacked middle or line management support, User perception of IS project as IT oriented rather than for the business was responsible for 90%, while poor project management and poor consultant effectiveness was responsible for over 90% of project failure among other failure factors.

Lack of management involvement and support is a key factor that contributes to many failed IS projects. Information System projects normally require a lot of resources which must come from top management. Also, if the presence of top management support is not felt by all the stakeholders to an IS project, employees often assume that it is an optional task to use the system, which leads to underutilization and abandonment (Hwang, 2014; Whittaker, 1999 cited in Watson, 2007). Sabherwal and Tsoumpas (1993) explain that most IS projects especially in large organisations are only introduced to top management who then delegate their supervisory role to a middle manager. Such a situation leads to a lack of ownership. Inadequate participation of managers in IS projects may also lead to a lack of alignment of business needs to the new innovation which affects its success, since the need for change will not have been well communicated to the organisation.

According to Watson (2007), another reason why IS projects are failing, is because they lack a sound methodology. Methodologies are useful in managing change in organisations, as a way to reduce IS failure and increase benefits. Watson notes that if a method of IS delivery does not achieve its benefits, then, it is a failed method. Indicators of poor methodology include inadequate or lack of planning, scope creep, mismanaged schedules, requirements shift, and large budgets.

Another challenge that IS projects face is establishing a good business case with well-defined and measurable goals (Whittaker 1999 cited in Watson, 2007). Without a good business case, it is difficult to obtain the support of all the key stakeholders towards a new Information System. According to Kontchnakov (2010) most times the wrong problem is addressed and as a result, the system conflicts with the business strategy, the organisation context is neglected and organisation culture ignored, which leads to incorrect system design. It also leads to poor collaboration between the client and development team, which may lead to lack of acceptance and resistance to the new system by users. Also important to note is that business scenarios are powerful tools for gaining stakeholder buy-in.

Several IS scholars including; Mpinganjira (2013); Vital Wave Consulting (2009); Bartis & Mitev (2008); Littlejohns, Wyatt & Garvican (2003) have cited organisational culture as a key

influencer of IS success or its failure. Factors such as organisational politics and power relationships have been known to have a serious impact on IS projects. A change in the power relations can trigger resistance from those that are loosing the power. Therefore inability to understand these relations and the role of the different stakeholders in the initial system analysis contributes to the system failure. Rogers (1983) discusses the diffusion of innovations in organisations based on the degree of reception. Rogers argues that organisations that have a culture of quick reception towards new innovations have less resistance towards IS implementations than the slow starters.

Watson (2007) notes that Information Systems are built to support user processes. While the introduction of IS may lead to restructuring, redefining positions and business processes, it is important to adequately communicate to the employees the role of the system and the changes that may occur. Klaus and Blanton (2010); Christophe, Elie-Dit-Cosaque and Straub (2011) have cited change management as a key factor in failure to effectively implement and use Information Systems. They argue that poor communication of changes results into user resistance. Since changes in organisation affect how employees carryout their day-to-day tasks, failure to adequately communicate new changes may create anxiety and apprehension, which negatively impacts their performance. This is most common with systems that impact users' influence on control and resources, work, as well as their beliefs.

Lack of user involvement in the project development does not only contribute to resistance by users towards the systems but also leads to inadequate capacity to use the system. According Chene (2009), inadequate training of users affects optimal use of systems, which results into a low return on investment. Lucas (1975 cited in Lyytinen, 1987) argues that users most times do not understand the information output from the Information System. Also users with limited understanding of the system may fail to know how the system supports the business, which leads to under utilization of the system (Askenas and Westelius, 2003).

Systems complexity is also increasingly becoming a challenge in IS implementation and use (Banerji, 2013; Abdelsalam, Reddick & ElKadi, 2010; Vital Wave Consulting, 2009). Users often find it difficult to map legacy processes onto new systems. Differences in understanding

what the systems can do by the users and implementers are often ignored during implementation of systems yet it largely affects how users view the system. In many organisations today, top managers initiate most innovations (Govindaraju, 2012) even if they lack understanding of how the Information Systems should support their organisation's business goals. And as a result they do not meet user and business requirements.

Other IS success challenges include; inexperienced project teams, unplanned change of system requirements and scope, the project is carried out for the wrong reasons such as technology pull or political push, commencement of other related projects which affect cooperation and, failure by organisations to learn from other failed projects and best practices (Littlejohns, Wyatt & Garvican, 2003; Kontchnakov, 2010 & Krigsman, 2010; Roodsaz, Behrooz & Behrooz, 2013).

In consensus, Chaudoir, Dugan and Barr (2013) note that the implementation process involves related multi-level variables such as the innovation, local implementation context and behavioral strategies used to implement the systems. Implying that once one variable is not well managed it affects the whole project and its effective utilization.

2.3 Information Systems Implementation Models
2.3.1 Lewin's Change Model

Change is a continuous aspect of any organisation and its effective management is crucial to the success of organisations. According to Lewin (1947) change is best achieved through a planned approach where individuals have to go through a learning process and understand the need for transformation. Lewin's planned approach involves four components: Field theory, group dynamics, Action research and the 3-step model of change (Burnes, 2004). Although these four components according to Burnes are often seen as independent aspects, they are interoperable. Lewin (1947b) infers to organisational change in three stages: Unfreezing, moving/transition and freezing.

Unfreezing:
To Lewin (1947b), in the unfreezing stage organisations start by understanding why change is necessary and for that reason prepare for the transition. Lewin suggests that before old behavior

is unlearned and new behavior adopted, the current situation needs to be destabilized or unfrozen. The author also observes that this is not an easy process and its application can be different in different contexts.

Moving/transition:

Lewin (1947b) observes that change is a process. Transition therefore involves taking a step towards the new behavior or a new way of doing things differently. Transition leads to a situation where organisational processes are studied, identified, and evaluated in an iterative procedure (Sareyreh, Khudair & Barakat, 2013). This stage is difficult on people because there is fear of the unknown and, there are several adjustments to be made. Therefore an action based learning approach is recommended to enable the group or individual to adjust towards the desired behavior (Burnes, 2004).

Freezing:

Freezing seeks to establish stability once the new changes have taken place. Lewin (1947b) notes that at this stage, the new changes are accepted and become the norm, new relationships are created and the new becomes routine. The author goes ahead to highlight that the new behavior should be adjustable or congruent with the behavior, personality and environment of the target users or else there will be rejection. Moreover, the freezing stage takes time and should not be rushed. Lewin (1947) ascertains that the new change must be a group activity where the group routines and norms are transformed or else changes to an individual will not be sustained. Therefore, refreezing may call for a change in organizational cultures, norms, policies and practices (Burnes, 2004).

In general, Lewin views organisations as complex and dynamic systems with mutually interdependent aspects (Lewin, 1947). The author also observes that a group is an important aspect that influences individual member behavior. Therefore changing individual behavior in isolation is fruitless since the individual has to conform to the pressures of the group. This means that all change must be centered at group level in terms of group norms, roles and processes (Burnes, 2004). According to Lewin, successful change can only be achieved when individuals

understand the change process in its entirety for change to be effected, it must be a collaborative process with all the stakeholders actively involved in effecting the change (Lewin, 1947b).

'Many writers acknowledge the significance of Kurt Lewin's contribution to organizational change' (Burnes, 2004). However, the Change Model has attracted a number of criticisms related to its appropriateness to organisational change processes. Most scholars argue that the freezing stage is unrealistic in today's modern view of change (Sareyreh, Khudair & Barakat, 2013). Change is seen as a more chaotic, process that demands flexibility. Also according to Lewin (1947), change can be short-lived as the group may quickly return to the previous level. This means that permanency of the new or desired level of change should be objectively addressed. The main concern is that the new change should be effectively managed so that it is maintained for the future, or else, people return to old ways of working.

2.3.2 Diffusion of Innovations theory

The diffusion of innovations by Rogers (1983, 1995) is described as the 'process by which an innovation is communicated through certain channels overtime among the members of a social system.' Rogers focuses on individual behavior towards diffusion of an innovation within an organisation. Rogers and Shoemaker (1971) developed a model that describes five stages that facilitate diffusion of new technologies to occur. These include: knowledge, persuasion, decision, implementation and confirmation. The authors ascertain that successful adoption of a new technology by users depends on their knowledge to use it or if they can perceive it benefits or relative advantage through a process of persuasion. On persuasion, users make a decision on whether to adopt or rejected the new system. The implementation stage continues when the users agree to adopt the new system. The final stage of confirmation involves reinforcing the decision to adopt the system and ensuring that the organisation is on board with the new system. The success of Rogers and Shoemaker (1971) model is influenced by Rogers (1983) four major constructs of the diffusion process; *innovation, communication channel, time* and *social system.*

An innovation: technology that is perceived as new to an individual or organisation. According to Rogers (1983), the rate at which the innovation will be adopted by members of an organisation depends upon; *relative advantage* (degree to which the new technology is better than the old

process or practice), *compatibility* (extent of consistency with existing needs, values and previous experiences), *complexity* (user perception on difficulty in understanding the system or complexity to use), *triability* (extent to which the innovation can be tested on a limited scale) and *observability* (extent to which the use and effects of the technology are visible in the organisation)

Communication channels: Bouman et al. (2005) explains that communication infers to channels through which the diffusion is carried within the organisations. These channels can range from mass media to social networks within the organisation. The role of individuals and their relationships within the organisation also play a key role in adoption or rejection of the new system.

Time: This studies the rate at which the individual decides to adopt the new system. The degree of adoption is described by Rogers (1983, 1995) in five main categories; *innovators* (engage in research and search on new ideas or often adopt new technologies at an early stage), *early adopters* (adopt the technology at a relatively early stage. They are often influential persons in the community), *early majority* (these adopt at the rate of an average person or organisation), *late majority* (are often skeptical on if the technology works and often wait till the average persons have adopted the new technology), *the laggards* (are a conservative group that are often suspicious of the new technology and may adopt the new innovation at a much later stage). According to Rogers, each of these groups describes a category of people within the social system or organisation.

Social system: Rogers (1983) refers to the social system as an environment to which the diffusion takes place. This can be a single unit within an organisation such as a department, a group of selected units or an entire organisation (Bouman et al., 2005).

Rogers' diffusion of innovation has also been used in others studies to understand the IS implementation and use in organisations, such as Bourgeois (2014); Warui, Mukulu and Karanja (2015); Isabalija et al (2011); Dwivedi, Wade & Schneberger (2012) and Chaudoir, Dugan & Barr (2013).

2.3.3 IT implementation model by Kwon & Zmud (1987):

The IT Implementation model is a six-stage model that is used to study IT implementation in organisations. The six stages include: initiation, adoption, adaptation, acceptance, routine use and infusion. Cooper and Zmud (1990 cited in Moore & Stafford, 2003) ascertain that the first three stages discuss the initial implementation process of acquisition, development and installation of a new information technologies in the organisation including the revision/development of organisation procedures, while the last three stages of acceptance, routinisation and infusion describe the post-implementation activities related to individual use behavior. Some scholars suggest that this model is an improved version of Lewin's change model (1947) where *initiation* represents the *'unfreeze'* stage*; adoption* and *adaptation* represent the *'moving or transition'* stage while the last three phases of *acceptance*, *routinisation* and *infusion* represent the '*freezing'* stage (Beaudry & Pinsonneault 1999; Tennant 2014; Guemez 2010).

Statnikova (2005) studied the six stage IS implementation model placing emphasis on four components (initiation, adoption, adaptation and acceptance). Kwon and Zmud (1987 cited in Statnikova, 2005) identified five major factors that affect the implementation of new technology innovations in organisations. These included; user community, organisation, technology, task, and organisational environment. Statnikova (2005) notes that these five major factors according to Kwon and Zmud are present at the various levels of the implementation process. However, in spite the popularity of the Kwon and Zmud model (1987) as a preferred implementation approach, Statnikova (2005) argues that, it does not emphasize the stages of implementation where these five major factors are most significant. Statnikova therefore went ahead to identify the various stages of implementation based on Kwon and Zmud's model where these factors where most significant including other activities that take place within these stages. Figure 1 below highlights the five major factors at the different stages of the Kwon and Zmud IT Implementation model as studied by Statnikova.
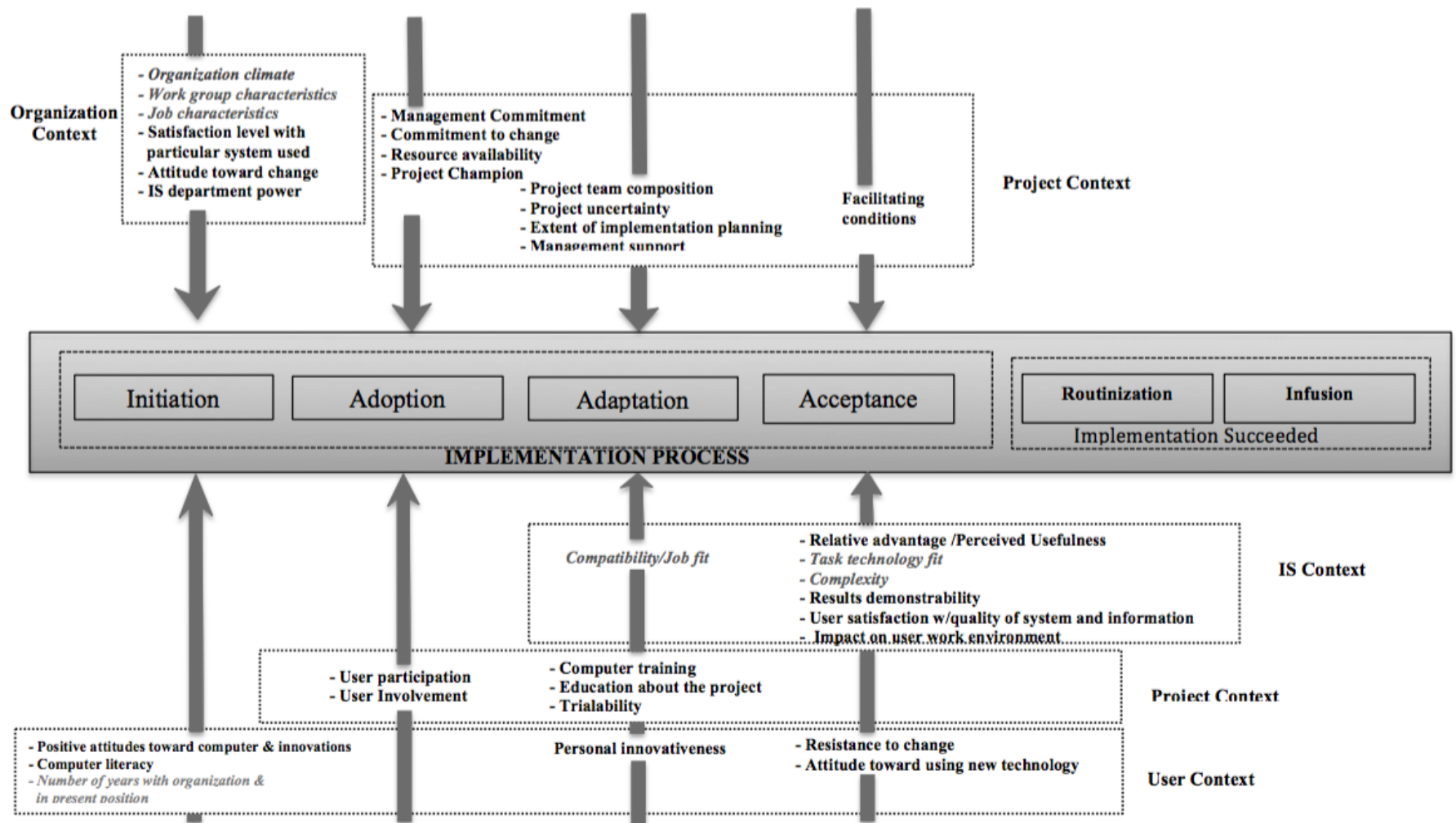
Figure 1: *The six stages IT Implementation Model.*
Source: Statnikova (2005)

Definition of the six stages and their different activities

Statnikova (2005) studied the Kwon and Zmud IT implementation model and described the different activities in each stage as per at what level they take place at four levels; Organisational level, user level, Information system level and Project level.

Initiation:

Initiation is the first stage of implementation. According to Guemez (2010), the initiation stage deals with examining the organisation for opportunities or problems that need the application of Information System solutions. The initiation of an IS solution may be a result of organisation need or a technological push. IS solutions are identified and introduced to the organisation. At initiation, it is important to understand the internal organisational setting and the environment in which the organisation is based. According to Statnikova (2005), most activities at the initiation stage deal with the organisation and the user. At organisational level, the author describes the need to understand the organisation climate in terms of (*politics, leadership, employee confidence in management, reward system, size and goals)*, work group characteristics such as (*nature of collaboration among workers, education or resistance to change)*, job characteristics such as (*control over work quality, responsibility over work outcome or level of autonomy),* understanding the satisfaction level with the particular/current system being used, attitude towards change and IS department power is also important in this phase. At user level, it is important to understand user attitudes towards computers and innovations, computer literacy, as well as, understanding the number of years that users have been with the organisation and in the present position. Statnikova urges that understanding these factors at the start of the project helps to identify the opportunity for change and, to create conducive environment for the implementation of a new system.

Adoption:

The adoption phase involves engaging top leadership and other stakeholders of influence into the benefits of Information Systems to establish their buy-in and commitment (Munkvold, 1999). It also involves a lot of negotiations towards the investment. A decision is then reached to either adopt or not to adopt the IS solution. Statnikova ascertains that the adoption stage majorly deals with the organisation and the user level. At the user level, user participation and user

involvement are crucial for the IS project success (Yoon, Guimaraes & Clevenson 1996). Statnikova (2005) urges that implementation teams must involve the user at this stage. This is important in letting users understand how relevant the system will be in their everyday work activities. When the users understand the relevance of the system as good and important to them, they are most likely to positively participate in project activities. User participation is also useful in obtaining ownership and commitment towards the project (Malhotra & Galletta, 2005). At organisational level, the key activities include; establishing management commitment, organisational commitment to change, ensuring that the resources are available for the implementation process and establishing a project champion within the organisation. Management plays a key role in influencing user participation to establish commitment. Management commitment is also important at each stage of implementation in ensuring that everything goes well. A project champion is usually knowledgeable about the system from previous experience and has confidence in the capability of the system. The project champion is key in inspiring system acceptance and adoption. In general, the key factor at adoption is gaining user interest and buy-in towards the system (Statnikova, 2005).

Adaptation:

Adaptation involves IS development, testing and installation in the organisation (Guemez, 2010). It also deals with understanding the current organisation practices and the change process in terms of using the new technology. Govindaraju (2012) notes that the adaption stage includes system alignment with organisation processes and tasks. Indeed user capabilities and attitudes are also studied at this stage. Users are then introduced to the system components and how it works through training on how to use the features of the new system. According to Statnikova (2005), the adaptation stage involves three levels. At project level, key activities include; establishing a skilled project team, managing project uncertainty through proper planning and, gaining management support. Other project activities include, education about the project, computer training and trialability (testing the system to ensure it fits organisation needs). The IS level, its important to understand and establish the system compatibility/job fit. While at user level, its key to study and understand the level of personal innovativeness among the target users. Overall, the major focus at adaptation is the transition process from a legacy system to the new information system, evaluating the technology-organisation tasks fit and adjusting the system to

promote long-term acceptance, commitment and use of the new system. According to Statnikova, strong management and user participation are key at this stage of implementation.

Acceptance:

According to Hsieh and Zmud (2006); Moore and Stafford (2003), this stage deals with gaining organisation commitment to use the system in their routine work. Statnikova notes that it is at this level that users actually start to use the system. Therefore, users tend to assess the features of the system and decide on whether it meets their needs and expectations. Govindaraju (2012) notes that stakeholder support and ownership is important at this stage. Key activities at this stage include user participation and involvement, good communication and top management support. At this stage, there is increased transfer of knowledge and skills from the implementation team to expected users of the new system (Govindaraju, 2012). Statnikova (2005) describes three levels that are involved at acceptance stage; user level, information system level and project level. At user level, it is key to study and manage user resistance to change and their attitude towards using the new technology. At information system level, establishing the relative advantage or perceived usefulness of the new system, managing the task-technology fit, complexity (the ease to use the system), results demonstrability, user satisfaction with the quality of the system and the quality of the information output from the system and, the impact of the new system on user work and environment. At project level, facilitating conditions such as capacity building and support among others must be available.

(e) *Routinisation:* At this stage, the use of the information system becomes stable. It is no longer viewed as an innovation but as an unnoticeable tool that has become part of the organisation structure and practice (Govindaraju, 2012). This stage describes a state where the system is perceived as an ordinary part of the work routine (Hsieh & Zmud, 2006). All procedures and practices related to the system become a habit, as users feel comfortable to use the various features of the system. Also routinization deals with the adjustment of the organisation governance structures, formalization of work procedures, IS-business ownership and performance measurement systems to encompass the IS as a new was of working. 'Management should encourage appropriate use of the system through institutionalization efforts' (Govindaraju, 2012).

(f) *Infusion***:** According to Hsieh and Zmud (2006), infusion deals with comprehensively and deeply incorporating the new technology into organisation or individual work processes. Also Individuals develop the capacity to fully use the system. Moore and Stafford (2003) contend that at infusion, the users refines their understanding and application of the IS to different tasks. There is also increased organisation understanding and acceptance of the system to support work process from continued reconfiguration and enhancement of the system overtime. This stage according to Moore and Stafford (2003) is identified by extended use, integrative use and emergent use. Extended use infers to comprehensively using the Information System features to perform various tasks. Integrative use implies using the IS to establish and enhance work linkages among these tasks. And emergent use involves using the IS to perform tasks that were initially not feasible or recognized prior the application of the Information system to the organisation tasks. At infusion, organisational benefits such as performance, effectiveness and efficiency are more visible from the continued use of the system for several tasks. Saga and Zmud (1994 cited in Hsieh and Zmud, 2006) note that the some of the IT implementation model stages may occur in parallel and not necessarily in sequence.

The IT implementation model by Kwon and Zmud (1987 cited in Statnikova, 2005) is a six stage IT implementation model, that has been selected as the foundation of the study because it integrates the different phases that affect implementation process and continued use of new Information Systems. Implementation as was described earlier by Bouman et al (2005) '*the phase of internal strategy formation, project definition and activities in which an adopted application is introduced within the organization, with the aim of removing reservations and stimulating the optimum use of the application'* has to be accepted by the different stakeholders in order for the Information System to be successfully deployed in the organisation. Therefore effective utilization of systems stems from the way the system is implemented within the organisation. For this reason, the study identified the existing IS use models and approaches by other studies in the area of Information technology Use.

2.4 Information System Use Models

IS use approaches such as Technology Acceptance Model (TAM), Theory of Planned Behavior (TPB) and the Unified Theory of Acceptance and Use of Technology (UTAUT), have been used in different studies to determine IS user confidence in the effectiveness of new systems (Au, Ngai and Cheng, 2002; Raza, 2011& Barnett et al., 2015).

2.4.1 The Technology Acceptance Model (TAM)

Davis (1989) demonstrated that a person's intention to use a new system was more likely to be determined by the user's perception of its usefulness and how easy it was to use. The author developed the Technology Acceptance Model (TAM) that was used to study user attitude towards new technology innovations. The Technology Acceptance model examines how human behavioral factors affect the acceptance and use of information technologies (IT) in organisations (Raza 2011). According to Davis (1989), the key predictors of use in TAM are *'perceived ease of use'* and *'perceived usefulness' which* influence the *'intention to use'* and *'actual use'* of new systems. Perceived usefulness was described by Davis as "the degree to which a person believes that using a particular system would enhance his or her job performance" and perceived ease of use, as "the degree to which a person believes that using a particular system would be free of effort".

In their study Venkatesh and Davis (2000) developed and tested an extension of TAM to what is referred to as TAM2, which explain how perceived usefulness and intension to use information systems is influenced by social influence factors (*Image, Voluntariness and Subjective norm*) and cognitive based processes (*Result demonstrability, Output quality, Job relevance and Experience*).

Venkatesh and Bala (2008) updated the Technology Acceptance Model from TAM2 to TAM3 focusing on a number of determinants that affect Perceived Usefulness and Perceived ease of use on new technologies. These included: *Computer self-efficacy, Perceptions of external control, Computer anxiety, Computer playfulness, Perceived enjoyment and Objective usability*. The continued improvement of the TAM model has enriched it to encompass the different behavioral aspects that influence the acceptance of new information technologies in organisations.
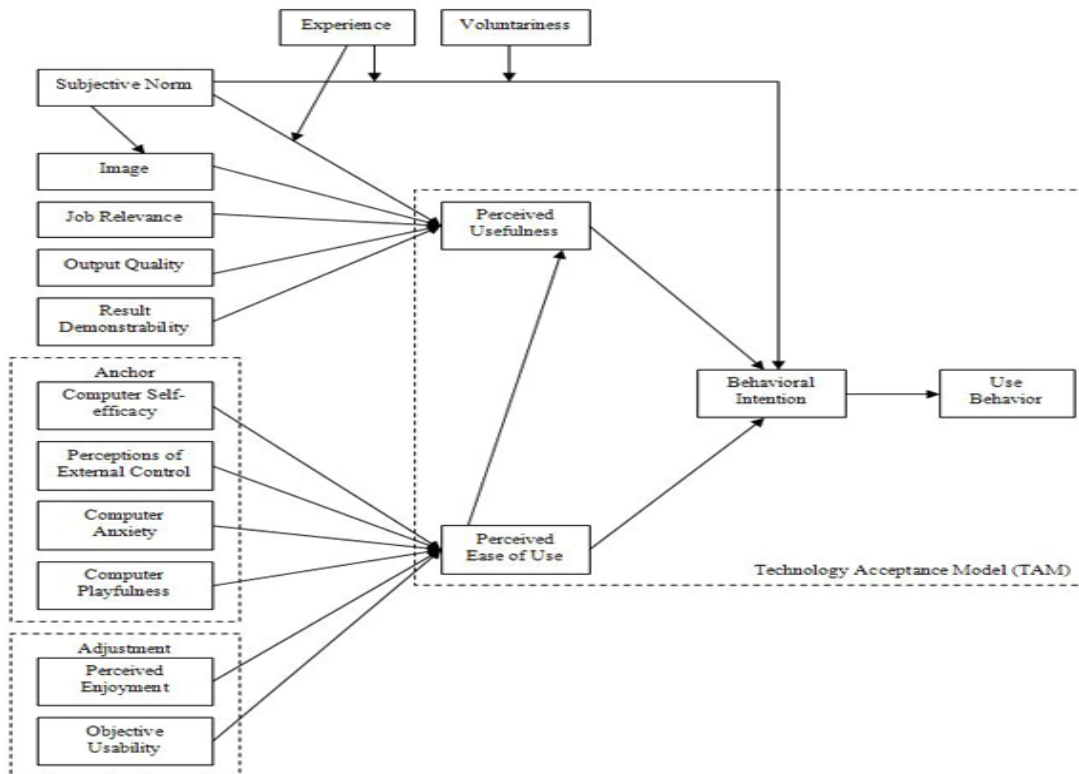
Figure 2: *Technology Acceptance Model.*

Source: Venkatesh & Bala (2008)

2.4.2 Theory of Planned Behavior (TPB)
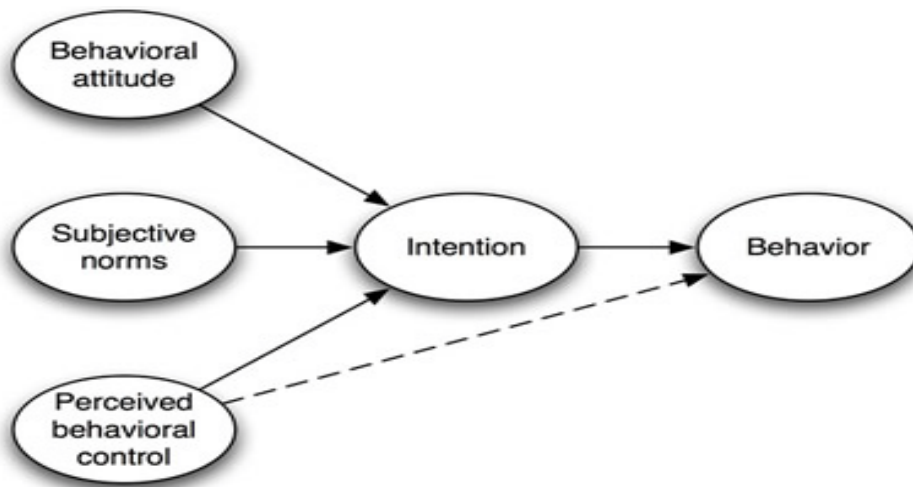
Figure 3: *Theory of Planned Behavior*

Source: Ajzen (1991)

Developed by Ajzen (1991), the theory of planned behavior is an improved version of the Theory of Reasoned Action by Ajzen & Fishbein (1980). TPB is used to study how a person's *intention* to use new technology is affected by his/her *attitude, behavior control or subjective norm*. According to Abugabah, Sanzogni and Poropat (2009), TPB is a successful model that has been used by researchers to predict behavior towards various situations such as new Information Systems. The authors also suggest that TPB could be used to examine new IS implementation context since it concentrates more on the user of the technology rather than the technology its self. However, Constantiou, Lehrer and Hess (2014) argue that the theory focuses on the intention to use the system rather than, actual use and the value of technology, which also largely determine IS success in an organisation.

2.4.3 Unified Theory of Acceptance and Use of Technology (UTAUT)

The Unified Theory of Acceptance and Use of Technology (UTAUT) model has been used in various studies to gain understanding of user acceptance of new technologies, under-utilization of technologies and to predict continued use of Information Systems (Thomas, Singh & Gaffar, 2013; Taiwo & Downe, 2013; Attuquayefio & Addo, 2014; Raza, 2011). The model combines eight other models which include: the Theory of Reasoned Action (TRA), The theory of Planned behavior (TPB), the Technology Acceptance Model (TAM), The motivational Model, the combined TAM-TPB model, the Model of PC Utilization (MPCU) the Innovation Diffusion theory (ID) and the Socio Cognitive Theory (SCT) (Venkatesh et al. 2003).

The UTAUT suggests that *Behavioral Intention* largely drives actual use behavior (Venkatesh et al. 2003). Thomas, Singh & Gaffar (2013) discuss the other constructs, which include; *Performance expectancy* – the extent to which the individual perceives that the use of the system will produce performance gains. This also can be described as perceived usefulness of the system. *Effort expectancy:* Implying the ease of use of the system. *Social influence:* The degree to which the individual perceives that people important to him/her think that he/she should use the technology (the same as subjective norm). *Facilitating conditions:* The perceived extent to which the organisational & technical infrastructure needed to support the systems exists. Other constructs identified in the model are *Gender, Age, Experience* and *Voluntariness of use,* which also affect the Use of the technology.
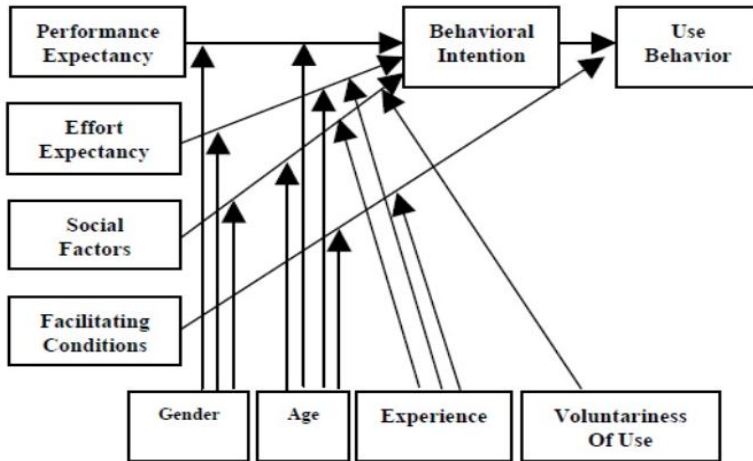
Figure 4: *Unified Theory of Acceptance and Use of Technology*

Source: Venkatesh et al. (2003)

2.4.4 Information Systems Success Model

The IS success model by DeLone and McLean (2003) is based on six interrelated success dimensions (System quality, information quality, use, user satisfaction, individual impact and organisational impact). According to the authors,

System Quality embeds elements such as ease of use, flexibility of the system, system reliability and, it should be easy to learn.

Information quality deals with the system output such as relevance of the information, accuracy, completeness and the competence of the staff to use the system.

Use factor looks at the way in which the staff uses the different feature in the system, frequency of use, extent and amount of use as well as the purpose.

User satisfaction, deals with the degree to which the users enjoy using the system for various tasks, generate reports, analysis and other system capabilities.

Organisation and Individual impact shows the extent to which the stakeholders benefit from using the IS for instance, improved organisational performance, productivity efficiency and decision-making.

This approach emphasizes the interdependency nature of the different concepts that contribute to IS success. This model has been used to study IS success and use in organisations (Bossen, Jensen & Udsen, 2013; Kaur & Aggrawal, 2013; Koo, Wati & Chunng, 2013; Kerta & Siryawan, 2013; Gunawardhana & Perera 2015).
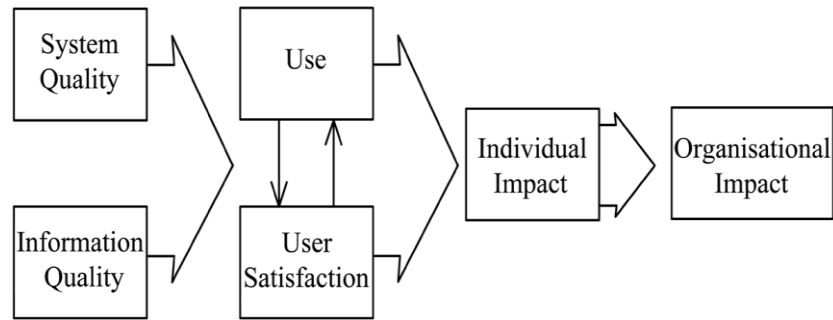
Figure 5: *IS Success Model*

Source: DeLone & McLean (2003)

The models highlighted above are construed towards IS implementation and use. They identify the various factors that influence IS acceptance and use when studying effective implementation and use as well as IS success. The different models provide a basis for understanding how the user behavior, organisational context, implementation process can be used to predict future use of the Information System.

In summary, researchers have examined the implementation and use factors for decades now. While some have examined behavior with focus on user intention towards the technology, others have examined how IS are implemented in organisations. But it seems previous research has not comprehensively focused on the role of effective implementation on IS success and its use in the organisation. Indeed, although technology acceptance and use models detail key factors in establishing use of Information Systems in organisations (Raza, 2011), they tend ignore other elements such as the system initial stages and deployment that also contribute to IS success.

2.5 Best Practices for Information Systems Implementation and Use

Information Systems best practices have also received a modest amount of attention in literature. They infer to success factors that an organisation must follow in order to succeed (Williams & Ramaprasad, 1996). The authors argue that failure to adequately capture these aspects will lead to less desired results or complete failure of IS projects. Some of the Critical IS success factors identified in literature include; top management support, effective communication, change management, project management, monitoring and evaluation, clear goals and objectives among others (Ahmad & Ceunca, 2013; Hwang, 2014).

According to Shao, Fang & Hu (2015); Ahmed, Azmin Bin Mohammad & Ahmad (2014) and Hwang (2014), top management involvement and support is very significant in IS success. The authors argue that the project team leader must make top management understand the effect of their support and involvement on the IS project success. Managers have a positive responsibility to identify and eliminate all kinds of barriers in the implementation process. They should avail financial and logistical support to prevent failure of IS. They also play a key role in maintaining congruence between the implementation process, organisational strategy and core values and, ensure the new system is viewed as a corporate effort where all the different stakeholders are involved. Other support is related to motivation of employees through negotiations, persuasions and bringing on board the most influential people in the organisation. This helps in instilling a sense of ownership and commitment. These factors not only contribute to better IS implementation but also reassure the employees and increase usage (Dorsey, 2005; Roodsaz, Behrooz & Behrooz, 2013).

Proper alignment of Information System features and goals with organisation tasks, processes and strategic goals is key in Information System success (Roodsaz, Behrooz & Behrooz, 2013; Bouman et al., 2005). Technology must be viewed as an enabler of organisational processes. As a result, it is important to adequately align the business processes with the features of the Information System. The authors also ascertain that technology offers the possibility to redesign organisational processes or offer an entirely new product or service altogether. The goals of the IS must be determined earlier in detail by the project team and approved before design of the system takes off. The documentation should also detail the cost of the new system and the expected benefits of using the system. In addition, the different tasks and change strategy should be defined and, the groups of people who will interact with the system identified.

Ensure suitability and accessibility. Bouman et al. (2005) contend that the technology has to be first available and reliable for it to be properly used. This means that compatibility must be studied to ensure it can work on various platforms and easily integrate with other technologies used within the organisation. Second to this, there has to be a good fit with the tasks performed

and the possibilities of the technology. Lastly, the technology must be to a larger extent easy to use.

According to Ruck and Welch (2012), effective communication in the organisation is intertwined with high levels of performance and employee commitment. Sumner (1991) notes that it is crucial for management to communicate ahead of time the changes taking place, the scope, objectives of the project and the activities that are going to be carried out. Al-mudigh, Zairi & Al-Mashari (2001) also points out that communication is necessary for the project team and the organisation in managing scope of the project, objectives and tasks of the IS project. The organisation can take on an open information policy where challenges are subsequently addressed or have a communication plan to ensure that the details on of the project are communicated including the need for change, how the change is going to be effected as well as periodic updates. Effective communication can also be achieved through user involvement in system development process and in identifying system requirements, which play a large role in acceptance and user satisfaction with the new system (Bano & Zowghi, 2013).

Project management is a key factor in IS success. Dorsey (2005) sights sound methodology as a IS success factor. The author argues that most IS are built without a thought process. As soon as enough information is gathered, the development starts. Inadequate attention is rarely placed on organisational processes, which affects the system. Where a methodology is used, it must be adequate to study the various aspects of development. In addition, the project must have skilled technical leadership to establish a level of control over the project team and ensure prioritization of key project aspect and also manage the data model and application design. The Technical leader is also responsible for ensuring that time and other resources are well managed (Bashel and Irani, 2010). It is important for the technical leader to have implemented a similar system before.

According to Blavin et al (2013); Chene (2009) and Al-Mudimigh, Zairi & Al-Mashari (2001), training of all stakeholders involved in the IS project from planning all the way to end-user implementation and use is important. The authors argue that heavy investment in training of staff helps to avoid undesirable outcomes in terms of organisational workflows, cost of the project and

productivity. People's perception of the role and importance of a technology is dependent on how they perceive reality (Bouman et al., 2005). Thus, training and building capacity enhances IS acceptance and proper acquisition of skills by the employees. Also, it can be used to gain organisational and employee commitment to the project, assess user capabilities and training needs, leverage skills of fast learners, define roles and responsibilities of users in the system and re-training to optimize system capabilities. Adequate training of users before system installation may help employees learn easily and, to identify potential system use issues.

According to Lewin's change theory (1947), it is possible to move past the anxieties of change towards progress. Deploying new systems in organisations may be a slight change of how tasks are carried out in a department or in some cases, or it could mean transformation or reengineering the entire organisation through elimination of certain operations, building of new business processes and creation of new structures to achieve great efficiency and organisational gains. Therefore, it is important for the organisation to support all stakeholders by engaging them in the change process to unlearn the old ways and learn new ways of managing tasks as well as helping them understand the benefits of the new system (Roodsaz, Behrooz & Behrooz, 2013). The key tools for managing change are leadership, training, planning, communication and having a reward system (Al-Mudimigh, Zairi & Al-Mashari, 2001). In general, recognizing the need for change is important and effective management of this change is critical in IS success (Chene, 2009).

Mpinganjira (2013) notes that Implementation of Information Systems in organisation often requires a considerable amount of financial investments. However, it is often difficult to quantify the benefits of implementing and use of technology or sometimes the benefits take long to be realized. This means that IS must be strategically planned for and well implemented so that the benefits outweigh the cost of these projects. In addition the costs of implementing the IS should be under control. Aligning the IS with business strategy and increasing the degree to which users actually use the IS can help improve the cost-benefits proportion.

Continuous monitoring and evaluation of the project is through its life cycle can help to ascertain progress, identify benefits, management of expectations, risks such as ensuring that the project is

still within scope and setting realistic targets for the different phases (Mpinganjira, 2013; Nowduri, 2011). Positive project outcomes can be used to enhance stakeholder support for other IT projects.

2.6 Summary of Constructs Identified

Table 1: Summary of Constructs Identifies as Significant

Approach	Identified Constructs	Related Literature
Lewin Change Model	Organisation climate, attitude towards change, stakeholder involvement,	Lewin (1947; 1947b; 1952)
Diffusion of Innovation theory	Observability, trialability, complexity, compatibility, relative advantage, social system, time,	Rogers (1983; 1995)
IT Implementation Model	Organisational climate, work group characteristics, job characteristics, level of satisfaction with particular system, Attitude towards change, IS department power, Attitude towards computer & innovations, number of years with organisation & present position, User participation & involvement, management commitment & support, commitment to change, resource availability, project champion, project team composition, project uncertainty, extent of implementation planning, compatibility/job fit, computer training, education about project, trialability, personal innovativeness, facilitating conditions, relative advantage, perceived usefulness, result demonstrability, user satisfaction with system quality and information, resistance to	Statnikova (2005)

	change, attitude towards new technology	
Technology Acceptance Model (TAM)	Perceived usefulness, result demonstrability, output quality, self-efficacy, perceived enjoyment,	Davis (1989); Venkatesh and Davis (2000); Venkatesh & Bala (2008)
Theory of Planned Behavior (TPB)	Behavioral attitude, use	Ajzen (1991)
Unified Technology Acceptance and Use of Technology (UTUAT)	Facilitating conditions, Performance expectancy, effort expectancy, experience	Venkatesh et al. (2003).
IS Success Model	User satisfaction, system quality, information quality	Delone & Mclean (2003)
The Open Group Architecture Framework (TOGAF)	Excellent project management, document requirement and seeking stakeholder approval, establish implementation strategy, determine business constraints to business continuity, IS business ownership	The Open Group 2009
Best Practices	Top management support, proper alignment, proper planning and training, communication, monitoring and evaluation,	Ahmad & Ceunca (2013); Hwang (2014); Roodsaz, Behrooz & Behrooz, (2013); Blavin et al. (2013); Sumner (1991); Mpinganjira (2013)
Other Studies	Regularize IS use, cooperation, system as social norm, IS-business ownership, system as performance measurements, system improvements, greater performance, expected benefits, staff in charge of problems and improvement ideas, regular audits, IS use policy, sustained IS use, IS acceptance, software mastery, software improvement, software evolution.	Govindaraju (2012); Hsieh and Wang (2007); PMBOK (2013); Tennant (2014); Lauterbach and Mueller (2014); Beaudry & Pinsonneault (1999); Hsieh & Zmud, 2006); Wierschem & Brodnax (2004); Laudon and Laudon (2012)

2.7 Conclusion

This chapter presented a review of the literature in relation to IS implementation and Use in organisations. It begins with an in-depth description of the challenges organisations face in the implementation and use of Information Systems. This is followed by an examination of existing models that have been used in different environments to either implement of increase the use of these systems. The chapter then identifies IS best practices that have been highlighted by various researchers with particular emphasis on implementation and use. Towards the end, the study carries out a comparison of the aspects addressed in existing models to highlight the gaps and areas that need to be addressed.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter presents the methods that were used to collect data and the procedures for data analysis. It gives an in-depth description of the research design, study population, sample size and selection, sampling techniques and procedures, data collection methods, data collection instruments, pretesting, data analysis, framework development procedure, ethical consideration, and the challenges faced when conducting the study.

3.1 Research Design

This study adopted the critical realism philosophy. The choice of the critical realism philosophy was based on the fact that it is well suited to relatively clearly bounded, but complex, phenomenon such as organisations (Easton, 2009), which is the focus of this study. Within the critical realism framework, the case study strategy was used. A case study can be defined as 'a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real context using multiple sources of evidence' (Robson, 2002). The case study strategy was chosen for this study because it gives room for a holistic analysis of a case in sufficient breadth and width in order to get insight into the larger cases (Oso and Onen, 2005). Secondly, it has been known to be relevant in situations where understanding the relations between information related technologies and organizational contexts are important (Orlikowski and Baroudi, 1991). In this study, the Ministry of Health, Uganda was used to examine the implementation and use issues in organisations. Based on the case study strategy, this study employed a qualitative methodology to collect data. A qualitative methodology was used because it is gives room for observation and study of the whole situation in order to evaluate the complexity of unique and general factors as well as the justification of their the validity to the study (Atieno, 2009; Choy, 2014). The current state of affairs at the Ministry of Health, Uganda was examined by asking the respondents to give their perception and opinion

regarding the current implementation and use of the iHRIS, while at the same time observing their attitude and behavior.

3.2 Study Population

Study population refers to the entire set of individuals, events or objects having a common characteristic about which generalization of findings will be made (Mugenda & Mugenda, 2003). In this study, the study population mainly comprised of those people that had either been involved in the implementation or are currently using the Integrated Human Resource Information System (iHRIS) that was recently commissioned by the Ministry of Health, Uganda (Wadembere, 2012). The implementers included, MoH senior managers, MoH IT staff and a team from Intrahealth. These were engaged in this study because they have a good understanding of both the process that was used to implement iHRIS together with the associated challenges. The users included; HR Staff, Records personnel and some MoH Senior managers. These were considered for this study because they have useful information about the implementation and use challenges, and their attitude towards iHRIS.

3.3 Sampling Procedures

3.3.1 Sampling Techniques

The choice of sampling technique affects the validity of the research and therefore it should be undertaken with maximum rigor (Procter & Allan, 2007). In this study, the main sampling method used was purposive – a non-probability form of sampling aiming at selecting respondents in a strategic way depending on the research questions (Bryman, 2008). This sampling technique was chosen because it helps in selecting key informants who have extensive knowledge and experience in the area one wants to study (Briony, 2006). The researcher intentionally selected participants that can best provide information that is insightful into the research questions of this study. Selection of participants was based on what Creswell describes as "criterion" sampling, which requires participants to have had experience of the phenomenon under study and are able to clearly describe their "conscious experience" (Creswell, 1998). In addition, the purposive sampling technique was used because it is the most suitable for small populations (Jarvinen 2004).

3.3.2 Sample Size

A sample of 38 respondents was selected from the identified categories of respondents. These included; 8 MoH senior managers, 5 officials of MoH IT unit, 10 officials from the Human Resource Division of MoH staff, 3 officials from Intrahealth and 12 staff members from the records department.

3.4 Data Collection Methods and Instruments

Data has been described as anything that is given as a fact (Walinda, 2013). Polit & Beck (2010) highlight that the goal of data collection is to generate data that is of exceptional quality. Qualitative research normally relies on methods that permit researchers into the personal lives of the participants. To facilitate this process flexible and varied methods are required. In this study, a number of data collection methods were used. These included; questionnaires, interviews, focus group discussions, observation and document review. The reason for using several data collection methods was to take advantage of the benefits associated with triangulation.

Data was collected from both primary and secondary data sources. Questionnaires, interviews, focus group discussions and observation were used to collect primary data. Primary data was collected from MoH senior managers, MoH IT unit staff, MoH Human Resource Division staff, and officials from Intrahealth and MoH Records Department staff. Secondary data was obtained from online journals and MoH internal documents.

Questionnaire

In this study, the questionnaire was the main data collection instrument. The questionnaires that were used in this study constituted both open and close-ended questions. They were designed in such a way that they were broken down into section according to the information requirements (See appendix 1& 2). Also, they were designed in such a way that they could be self-administered. Katebire (2007) observes that self-administered questionnaires are easy to administer, provide quick responses, and the analysis is faster. Respondents were encouraged to expand upon their answers to specific questions by providing explanations, rationale, and additional content.

Interviews

Amin, et al (2005) observes that interviews are useful since they fetch variety of ideas needed for a study. While interviewing, data is collected from the respondent by asking questions in a face-to-face or one-to-one approach. The interviewer directs questions to the interviewee (respondent) from an interview guide, which is well structured, and the interviewer fills in the responses.

In this study, interviews were used as a follow up method on issues that had been either left out or not clearly explained in the questionnaires. This method was used because it helps to obtain in-depth information, and allows further probing. Although interviews were time consuming and rather expensive, they were advantageous in many aspects as they generally helped to minimize non-responses. Interviews were mainly used to collect more information from mainly MoH senior managers, as many of these did not have enough time to respond to all the questions in the questionnaires. This not only helped to get responses to unanswered questions in the questionnaires but also helped researcher to get an in-depth understanding of some of the subjects under investigation. The interview guide had mainly open-ended questions because, the researcher wanted to obtain unlimited answers.

Focus Group Discussions

According to Walliman (2011), focus groups can be seen as a type of group interview, but one that tends to concentrate in depth on a particular theme or topic with an element of interaction. The group is often made up of people who have particular experience or knowledge about the subject of the research, or those that have a particular interest in it in this study. Focus group discussions were mainly used when collecting information from staff of the Human Resource Division and Records personnel regarding their opinion of the implementation process and attitude towards the Integrated Human Recourse Information System. Focus group discussions were used because they enabled the researcher to get data in the respondents' own words on how they felt about the new system. This also helped the researcher to get deeper insights on the perceptions and attitude towards the iHRIS.

Observation

Observation was used to verify information obtained from questionnaires, interviews and focus group discussions. This method was also used to gather information that could not be readily

obtained using the other data collection methods. This was very rewarding because the observation of the body language of the respondents most especially during interviews and focus group discussion helped a lot to not only reveal the attitude of the respondents towards the new system but also the truthfulness of their responses.

Document review

Documentary analysis was used to capture data that could not readily be obtained using the other data collection instruments. Secondary data was acquired from the review of existing literature and supporting documents such as published journals, books and MoH publications. Document review was particularly useful in helping the researcher get an in depth understanding of the concepts under study

3.5 Quality Control Methods (Validity and Reliability)

In order to address the content validity of the instrument in this study, the design of the interview guides was based on literature from previous similar studies and pre-existing questions that were modified to suite the study. Hyman et al. (2006) observe that using pre-existing survey questions provide accurate measures, as they are pre-tested before first usage. This means that the degree of validity and the quality of data are likely to be high.

The interview guides were pre-tested on some of the prospective respondents to this study to establish the suitability of the questions. Some questions were reviewed basing on the comments and suggestions from the respondents. The reliability of the instruments was tested using "Test-Retest" (Heise, 1969) method.

3.6 Data Analysis

This research adopted the qualitative data analysis approach for data analysis. Qualitative data analysis is defined as a range of techniques for sorting, organising and indexing qualitative data (Grbich, 2012). Paulson (2009) and Silverman (2010) view qualitative analysis as an interactive process that is formed by the subject and the researcher's social role such as age, gender experience, social class, ethnicity and biases. The authors note that qualitative analysis is not quantifiable, rather it is an iterative and interpretive process based on context. Data analysis is considered the most difficult phase of a qualitative study and the one that is discussed the least in

the literature. This is due to the fact that published studies normally give enormous attention to the description of research sites and data collection sources and disregard the discussion of analysis (Thorne, 2000). Yin (2009) also claims that the 'analysis of case study evidence is one of the least developed and most difficult aspects of doing case studies'.

After reviewing the potential approaches that can be employed to analyse the data for this qualitative case study research, the researcher decided to adopt Colaizzi's (1978) framework for qualitative data analysis (See Appendix 3). In this study, the data analysis process went through a number of phases. First, the researcher reviewed the responses of each respondent and then extracted useful statements. The meaning of each statement was then formulated and there after the formulated statements were organized into themes. A description of the themes was then done. Once this was done, the researcher, went back to some of respondents to cross check with them whether what had been recorded is exactly reflects their responses.

3.7 Development of the framework

The IS implementation and use framework was developed by integrating several implementation and use approaches. The main approach that was adopted by this study was Statnikova's (2005) IT implementation model. Six stages of the Statnikova's IT Implementation model were adopted and improvements were made using other implementation and use approaches including Lewin's change model, Diffusion of innovations theory, TAM, TPB, TOGAF, UTAUT and IS Success model. Some elements of IS critical success factors were also incorporated. In developing the proposed IS implementation and use framework, optimization was added to the post-project phases. By adding this stage, we extended Statnikova's IT implementation model.

3.8 Ethical Considerations

This study followed the research guidelines defined by Uganda Martyrs University. Permission to conduct the study was obtained from the management of Ministry of Health (see appendix 4). Before conducting the study, the purpose of the study was clearly explained to the respondents and consent for participating in the study was sought from them. Emphasis was made on the fact the information collected would be handled with optimal confidentiality and that it would be used for academic purposes only. Response was voluntary and no respondent was forced to participate.

3.9 Challenges/Limitations of the Study

This study had several limitations that future studies should take into consideration. First, the study was limited to a single case study. The dependence on a single case study to study a phenomenon is a frequent criticism of the case study research (Yin, 1994). However, this single case issue was offset because the iHRIS, which was the selected case for this study is one of the recently implemented information system that many observers feel has been underutilized. It therefore had all the conditions that allowed the researcher to investigate the factors that influence implementation and underutilization of Information Systems in organisations. Also because of its recent implementation, the implementers and users of the iHRIS were readily available and therefore, it was easy to study both its implementation and current use.

Secondly, the sample size was very small and consisted only responses from thirty-eight (38) participants. Even with this small number of participants, administering the questionnaires and setting time for interviews and focus group discussions was a hassle. Most of the employees of the MoH seemed busy and it was difficult for them to allocate time to respond to the questions. However those that managed to respond did so with a lot of interest and care. The researcher is certain to claim that the findings are a true overall reflection of what has happened with regard to the implementation and use of iHRIS. The respondents selected for this study were general representation of the target population. The researcher selected a mixture of respondents from MoH and Intrahealth.

Another limitation was that the case was limited to one particular implementation in one type of organization. IS implementation research is sensitive to the context in which it occurs and that usually is the subject of the concern to the generalizability (Trochim, 2001). Therefore, the framework that was developed should be tested in different environments to assess its effectiveness.

3.10 Conclusion

This chapter described the methodology that was used in this study. It gave a detailed description of the research design and the reasons for the choice of that approach. It also reported on the study population, sampling techniques and procedures used plus the sample size. A description

of how data was collected and analyzed was given together with the justification of the techniques that were used. Furthermore, this chapter presented a brief explanation of how the implementation and use framework was developed. Lastly this chapter stated the ethical considerations and challenges/limitations to the study. Chapter four proceeds with the presentation, analysis and discussion of findings

CHAPTER FOUR

FINDINGS, EXISTING FRAMEWORK AND ANALYSIS

4.0 Introduction

This study sought to design a framework for effective implementation and utilization of Information Systems in organisations. Emphasis was put on understanding how Information System are initiated and used in organisations. The Ministry of Health was adopted as a case study. This was based on the fact that the Ministry of Health is one of the many Government agencies that have implemented various Information Systems that seem to be under-utilized.

This chapter is divided into seven sections. The first section gives a background of the characteristics of the respondents for this study. The second section looks at the background of the case study and introduces the information system under study (iHRIS). The third section discusses the implementation of iHRIS at the Ministry of Health. The fourth section looks at management commitment to the change process with the introduction of iHRIS as an HR management tool. The fifth analyses the task-technology fit, complexity and training aspects. In the sixth section user attitude towards iHRIS is discussed while the seventh section looks the challenges and issues of system use within the Ministry of health. The discussions in this chapter are in line with the objectives of the study, literature reviewed and the data collected.

4.1 The Respondents

This section introduces the various categories of respondents that were engaged in the study. The table below gives the distribution of the different categories of respondents.

Table 2: Categories of Respondents Identified in the Study

Source: Field findings

Category	Role	Number of Respondents
MoH Senior managers	Implementers	8
Intrahealth Staff	Implementers	3
IT staff	Implementers	5
HR staff	Users	10
Records personnel	Users	12
Total		38

A total number of thirty-eight (38) respondents were engaged in this study. These included; MoH senior managers, Intrahealth staff, IT staff, HR staff and Records personnel. MoH senior managers included; Commissioner Quality Assurance, Commissioner Human Resources, Commissioner Planning and their respective deputies. These were considered for this study because they play key role in mobilizing resources and support for new systems. The Intrahealth staff included the Chief of Party, informatics Manager, Developer. They were included in the study because they were believed to have been at the heart of iHRIS introduction to MoH, implementation and consequent monitoring of its use at the Ministry. IT staff comprised of Systems Administrators and Information scientists. These were considered because they were thought to be knowledgeable about the implementation process of Information Systems at the Ministry. Also because they are always in touch with the users of Information Systems on a day-to-day basis, they were believed to have vital information concerning user attitudes towards the implemented systems. The Human resource Managers and Records personnel are the actual users of the iHRIS and for that reason had to be included in the group of respondents. These were also thought to have good understanding of the strengths and weaknesses of the iHRIS.

4.2 The Case Study

4.2.1 Ministry of Health

The Ministry of Health (MoH) Uganda is a government body responsible for all health related activities within the country (MOH, 2010). The mandate of MoH includes; policy formulation, policy dialogue with Health Development Partners, resource mobilization and budgeting, strategic planning, regulation, standards development, quality assurance and capacity building among others (MOH, 2010). The Ministry of Health in Uganda was started in 1902 to take care of all health matters such as epidemics, vulnerable diseases, training of medical workers and, delivery of other medical services (MoH, 1987). Today, the Ministry of Health provides leadership for the health sector: it takes a leading role and responsibility in the delivery of curative, preventive, promotive, palliative and rehabilitative services to the people of Uganda in accordance with the sector plans.

The Ministry of Health is sub-divided into various institutions that deliver services and play various roles. These include both autonomous and semi-autonomous national institutions such as; the Uganda Cancer Institute, Uganda Heart institute, Uganda Virus Research Institute, National Public Health Laboratories, various professional councils among others. The Units of health delivery include: National Referral Hospitals, Regional Referral hospitals, General hospitals, Health Centre IVs, Health Centre IIIs, Health Centre IIs and HC I (here services are delivered from house to house by Village Health Teams (VHT)). In the report MoH (2011), it is highlighted that both public and the private sectors play a key role in the provision of health services in Uganda. Overtime, structures have been put in place to ensure that all people in Uganda have equitable access to the basic package of health care.

Vision

A healthy and productive population that contributes to socio-economic growth and national development (MoH, 2010)

Mission

To provide the highest possible level of health services to all people in Uganda through delivery of promotive, preventive, curative, palliative and rehabilitative health services at all levels (MoH, 2010).

4.2.2 Information Systems used at the Ministry of Health

For the last two decades, the Ministry of Health has embraced the use of information and communication technologies as a way of enhancing efficiency and improved health care service delivery. A number of Information Systems have over the years been implemented by the MoH including but not limited to; patient records tracking systems, disease surveillance systems, drug supplies and monitoring systems, Integrated Financial Management System (IFMS), Integrated Personnel and Payroll System (IPPS), knowledge management portal and the integrated Human Resources Information System (iHRIS). While these systems continue to function at different levels of sophistication and complexity, their implementation has been problematic and their utilization very poor (Namakula & Kituyi, 2014).

For purposes of this study, the iHRIS was chosen to help in understanding how Information Systems are implemented and utilized in organisations. The choice of the iHRIS was based on the fact that it is one of the systems that is under utilized despite that it has been well supported in terms of financial resources, trainings and availability of technical team (Driessen et al. 2015; Wadembere, 2012). Also, the iHRIS has been implemented within the larger public health sector and its affiliated institutions. These include health examination boards and specialized health care institutes such as the cancer institute and medical bureaus that provide health care alongside the government health facilities (MoH, 2013). Therefore, because of the nature of its coverage, the iHRIS was selected as the main system under study within the Ministry of Health.

4.2.3 Integrated Human Resources Information Systems (iHRIS)

The iHRIS is an integrated management tool that is used by MoH to design and manage a comprehensive Human Resource (HR) strategy (MoH, 2013). It is made up of five core components that include; *iHRIS Qualify* deals with workforce registration and licensing, *iHRIS Manage* is used for everyday HR management, *iHRIS Train* captures pre-service and in-service trainings, *iHRIS Retain* for attraction, motivation and retention of staff and *iHRIS plan* for effective planning and projection of the available resources.

The Ministry of Health with the aim of managing the workforce effectively and efficiently deployed the iHRIS in 2008. The iHRIS enables the ministry to have a centralized information base of all the HR aspects, inclusive of all the health departments spread across the different geographic locations in the country. The primary role of the iHRIS is to manage ministry staff at headquarter, local governments (district level), hospitals and those under non-government health agencies but are supervised by the ministry. Also, decision makers within the Ministry use information output from this system to answer key human resources management and policy questions.

4.3 The iHRIS Implementation Process

In order to examine how Information Systems are implemented in organisations, this study sought to understand the approaches that were used to implement the iHRIS within the Ministry of Health. The iHRIS like many other Information Systems in MoH is donor funded. Respondents engaged in this study indicated that implementation of donor-funded systems in government institutions is usually the responsibility of the donor agency. Because of this, the implementation of iHRIS was largely managed by Intra-health who were the donors of the system with very little input from the stakeholders within MoH. Respondents engaged within this study noted that during the implementation phase of iHRIS they were informed about the new system but were never informed of how it was going to be implemented. They said that the sensitization about the system was done in workshops and face-to-face interactions with the member of the MoH IT unit. In an interview with one the commissioners in the Human Resource Division, he had this to say:

> '…our role was to just accept what the implementation team from Intra-health was telling us to do. Actually, Intra-health did most of the iHRIS installation, sensitization and training. We were not very involved in the implementation process, which I think has affected the use of this system' (Interview held at MoH headquarters on 14th July 2016).

In addition, a respondent from the IT unit of MoH, reported that the Ministry does not have an agreed upon methodology of how Information Systems should be implemented. This respondent noted that the procedure for implementing a new system was such that the donors first meet top

management to explain to them what they stand to benefit if the system is implemented. Once management is convinced that the system functionality meets the information needs of the organisation, system development and installation commences. The training of users is normally done by the donor agency and then later the new system is brought on board.

This Information Systems implementation procedure falls in some of the phases of the Kwon and Zmud (1987 cited in Statnikova, 2005) implementation process. While this procedure is simple and easy to manage in a complex organisation such as MoH, some key implementation aspects like initial user buy in and business process alignment are often ignored. Also the ministry tends to rely on the expertise of individual consultants and their ability to develop a working system, which later affects actual system use and, alignment of everyday tasks to system features by the users.

To further understand how iHRIS was implemented this study sought to assess the support provided by the implementation team to the prospective users. Most of the respondents engaged in this study indicated that the implementation team provided in their view sufficient support to MoH staff. The respondents noted that step-by-step procedures were taken by the implementation team to ensure that all users acquired the necessary skills to use the system. This is in agreement with what Kwon and Zmud (1987 cited in Statnikova, 2005) observed that training and support of users is key to successful Information Systems implementation. The respondents further noted that the implementation team was highly equipped and knowledgeable about the implementation process.

As part of the assessment of the implementation process, this study also investigated the level of involvement of the different stakeholders within the Ministry of Health. Responses from the different stakeholders indicated that some of them were actively involved while others gradually withdrew from the implementation of the iHRIS. According to some respondents, there was a lot of 'organisation politics' involved in the implementation of the system. They sighted issues such as craftiness, discriminative tendencies and power wars. This according to some respondents discouraged them from actively participating in system implementation, hence created a negative

attitude towards the iHRIS. For instance in one of the focus group discussions, a respondent said that:

'*For us we were excluded from those things. I think this project is for some people not all of us'.* (Interview held at MoH headquarters on 16th July 2016).

Analysing how the system was implemented, it was evident that the system would not be fully embraced by all the stakeholders within the Ministry of Health. In practice, Intra-health who were the donors fully owned the implementation process. For effective implementation of Information Systems in organisations, there is need for the user organisation to champion the implementation process. The user organisation should be actively involved in determining what processes should be supported by the new system and how the new system must be rolled out. Ngwenyama & Nielsen (2013); Vaughan, (n.d.) establish that increasing user involvement and participation through the system implementation process will enhance user's attitude towards the system and the desire to use it.

4.4 Management Commitment to Change

Shao, Fang & Hu (2015) and Ahmed, Azmin Bin Mohammad & Ahmad (2014) have argued that top management involvement and support is very significant in IS success. They infer that project team leaders must ensure that top management is committed to the change that will come as a result of the implementation of new systems. It is therefore against this background that the study investigated the commitment of top management towards the implementation of iHRIS. Respondents engaged in this study reported that in the initial stages of the iHRIS implementation, top management at MoH seemed enthusiastic and committed towards the project. They said that management was supportive in creating time for trainings, providing necessary equipment and meeting venues for both the implementation team from Intra-health and the MoH staff. However, some respondents noted that there was gradual loss of management commitment as the project progressed. One reason that was cited by the respondents for the gradual loss of management commitment towards the iHRIS project implementation was that it had dragged for a long time without realizing any significant value to the different stakeholders at the Ministry. This could be attributed to the fact that implementation was not championed by the Ministry. According to some respondents, the use of 'Ubuntu', a Linux operating system

discouraged the MoH management team from getting committed to this project since they were more familiar with the 'Windows' operating system. Some respondents to this study noted that the Government directive on which systems ministries must use to handle the HR functions such as the Integrated Personnel and Payroll System (IPPS) affected the commitment of the MoH HR leadership towards the iHRIS. In an interview with an HR staff member, he said:

> '...there is a Government directive that all ministries must use the IPPS to capture HR data. We have been capturing this data using iHRIS and it has become double work to update both systems. So we have no choice but to use IPPS.' (Interview held at MoH headquarters on 17th July 2016).

As highlighted earlier, Whittaker (1999 cited in Watson, 2007) observes that lack of management involvement and support is key factor that contributes to many failed IS projects. Information System projects normally require a lot of resources which must come from top management. So, if the presence of top management support is not felt by all the stakeholders to an IS project, employees often assume that it is an optional task to use the system, which leads to underutilization and abandonment.

4.5 Task-Technology fit, complexity and Training

To understand why users normally abandon Information Systems, this study also investigated how iHRIS supported the different organisation processes and, user support in terms of training and capacity building. Respondents indicated that the system effectively supports their work routines. They also added that the system generates most of the reports that are required to take decisions within the Ministry.

Figure 6: *Screen shot of reports generated by iHRIS.*

Source: iHRIS, Ministry of Health, Uganda.

On the Issue of complexity, respondents reported that the system is easy to use since it is web based and its graphical user interface is easy to follow. In a focus group discussion, one staff member from the HR department commented that:

'In my case, I was already interacting with other systems. So an additional one was not difficult. Even the fact that it was hands on training, it simplified the work.' (Focus group discussion with HR staff held at MoH headquarters on 20th July 2016).

Respondents to this study however noted that there is need for regular support most especially in the districts where the level of computer skills among users is low. Al-Mudimigh (2001) contends that effective training of users during systems implementation is important in

acceptance and proper utilization of Information Systems. He further adds that training can be used to gain organisational and employee commitment to a new system, optimize system capabilities and identify potential system use issues.

4.6 User Attitude Toward iHRIS

Garg (2010 cited in Angelo, 2015) notes that user perception of Information Systems as being IT oriented rather than how they support business has been responsible for 90% of IS failure in organisations. Also, Lucas (1975 cited in Lyytinen, 1987) argues that users most times do not understand the information output from the IS. This limited understanding of the function and value of systems tends to affect their utilization. In a focus group discussion that was conducted among the Records personnel, they noted that the HR staff do not demand for records update and completeness within the system. One respondent said:

> *'The HR staff do not give us the data to enter in the system. Even when we enter it, they still ask for the paper files to get that information. So we do not know if we should continue to capture this information in the iHRIS or not'* (Focus group discussion with HR staff held at MoH headquarters on 12th July 2016).

In contrast, most of the respondents to this study reported that iHRIS simplifies their work; it makes it easy for them to search and retrieve documents. They also said that originally, they would do a lot of work in order to get staff lists and retirement plan. According to them, this work was initially done manually but with the introduction of iHRIS, this has been made easy. They further added that they could now work from anywhere because the system is web based which has greatly contributed to their productivity. It is therefore important to note that the attitude of users towards and Information System has a significant contribution towards its acceptance. Studying the influence of attitude on behavior, Ajzen & Fishbein (2000) observe that more attention needs to be placed on the role of emotions in predicting intention and actual behavior. The authors explain that under the reason action approach on predicting behavior attitude and intentions have a strong impact on behavior.

4.7 Challenges & Issues of System Use

In an effort to understand why iHRIS is underutilized, this study investigated the challenges and issues associated with its use. These challenges are discussed in the subsections below:

4.7.1 Platform Issues

Initially the iHRIS system was a 'stand alone' and it was discovered to be more stable (i.e. less system crashes due to malware and running capability) and secure on open source platforms. Specifically the system was installed on 'Ubuntu' a Linux operating system version. The study found that the introduction of the Linux operating system created a need for users to learn new skills in using the Ubuntu operating system and related open source application. The complexity in learning the new operating system created a poor attitude towards the iHRIS especially in an environment that is largely 'Windows' based. This attitude issue extended on even after the system had been networked and users could access it off the Windows platform. Therefore in this case the limited computer knowledge by users was a hindrance to continued use and in cases where staffs had a modest understanding of basic computing, in-depth maneuvering of the systems was a problem. Indeed most staffs tended to shy away from use of the system, which contributed to internal system sabotage. Further, high staff turnover within the HR department especially through inter-ministry transfers and better opportunities affected iHRIS use, since each time the staff started to get familiar with the system; they are rotated to another Ministry or moved to other firms.

4.7.2 Organisational Climate

Most Information Systems in government institutions especially in developing countries like Uganda are usually donor funded (Gichoya, 2005). While this is a great initiative, the effective implementation and use of these systems is normally hampered by issues such as organisation politics, leadership, and the attitude of employees towards their supervisors. In the case of iHRIS, the implementation team chose to work with those staff members that seemed committed to the implementation process. This in a way created as sense of disunity and power struggles, which in turn negatively affected the implementation and use of the system. Also, the selection of which MoH officer to be included in implementation entirely depended on the supervisors. This created friction and mistrust between subordinates and supervisors since some officers felt

that they had been intentionally left out of the project. These disgruntled officers quietly withdrew from all activities related to the implementation and use of the system.

The other issue that has had a negative impact is how HR division handled the iHRIS roll out process. According to some respondents, HR management was not fully involved in the implementation of the system. Because of this, the implementation team from Intrahealth spearheaded the implementation process. Biehl (2007) and The Open Group (2009) emphasize the need for recipient organisations to champion new initiatives and strategies. The failure of the HR division at MoH to champion the iHRIS roll out, could have affected the way in which the system was received and used. Looking at how iHRIS was implemented, it can be concluded that the implementation team from Intrahealth did not fully perceive the effect of the organisational climate on the introduction of iHRIS to this organisation. Thus in-depth understanding of organisational environment in terms of politics, leadership and collaboration amongst stakeholders is key to success planning, implementation and use of information systems.

4.7.3 Change Management

Szamosi and Duxbury (2002) contend that change management should be an essential aspect of any organisation. In order for organisations to effectively implement and utilize information systems, they need to address change aspects. Respondents to this study mentioned that there was an attempt by the implementation team to prepare the MoH staff for change. However, the degree of responsiveness by MoH staff towards change was inadequate. Some HR staff according to the respondents kept away from change management activities. This in away affected their ability to transit from their current way of doing things to the new processes supported by iHRIS. Much as the Intrahealth team had a change management plan, the Ministry of Health does not have a clear guideline of how change can be effected. Most times, the Ministry relies on the expertise of donor agencies. This in itself is a challenge because different donor agencies have their own change strategies and time-lines which in most cases focus on different aspects of change management. To effectively manage Change, organisations must carefully consider successful change best practices including; adequate planning, proper governance of the change process, establish leadership commitment to change, stakeholder communication plan, organisation needs assessment and capacity building.

4.7.4 Presence of Similar Systems

Oketcho et al. (2015), note that 'the Ugandan health system suffers from dual management' which affects timely decisions making. For instance the HR division at MoH coordinates with two other Ministries including; the Ministry of Public Service which manages human resources employment policies, strategies, and management and, the Ministry of Finance, Planning and Economic Development, which is in charge of the budget and finance component. Presently, each Ministry has an independent Information System that is utilized by the HR division at the MoH. These systems include; the Integrated Personnel and Payroll System (IPPS), the Integrated Finance Management System (IFMS) and iHRIS. Although there are inter-ministry discussions and plans to integrate all three systems, respondents noted that efforts to this end are yet to be seen. One of the HR managers indicated that there is a government directive to all Ministries to use of the IFMS and IPPS for HR management. Moreover, these two systems were implemented on Windows platforms, which is popular among MoH computer users. These two factors have negatively affected the utilization of iHRIS among the HR staff of the Ministry of Health. If iHRIS is to be effectively utilized, there is need for MoH to put in place policies that compel HR staff to make use of the system.

4.7.5 Institutionalization and Optimization

There is no clear policy that compels the MoH staff to use iHRIS. The Management at MoH has committed itself to using iHRIS as an HR tool. However, there is gap in monitoring the effective utilization of this system. It also appears that no audit has so far been carried out to assess the effective utilization of iHRIS within the Ministry of Health. Although the implementers of iHRIS have continued to customize the system to meet organisational goals, there is need to launch awareness campaigns by MoH so that users can be informed of the various functionalities of iHRIS. This can be done through workshops and trainings.

4.8 Conclusion

In this chapter a detailed description of respondents and the case study was presented. In addition, nature of iHRIS implementation and use process at the Ministry of Health was presented in detail. The findings of this study indicate that inadequate policies and guidelines for

systems implementation of at MoH largely affected the way the system was accepted and how it is currently used by the HR staff. On a positive note though, the development of an effective implementation and use information systems framework can be a starting point that the Ministry of Health can benefit from to improve current level of utilization of iHRIS and future implementation of new systems. A comprehensive integrated Implementation and use framework is a good tool for any organisations to best transcend through the different stages of an IS project.

The MoH systems implementation process is more aligned towards the IS success model by DeLone and McLean (2003). The stakeholders place more emphasis on the information quality, systems quality, use, user satisfaction and net benefits on the individual side and the benefits for the organisations. However, as discussed earlier in Chapter two, there are other key aspects that the IS success model does not put into consideration such as the organisation climate in terms of culture, collaboration among the different stakeholders and a general lack of coherence between organisation tasks and system capabilities.

CHAPTER FIVE

DEVELOPMENT OF IS IMPLEMENTATION AND USE FRAMEWORK

5.0 Introduction

The bottom line of successful IS project implementation and use is that organisations can be able to benefit from the introduction of these technologies in terms of increased performance, competitiveness, efficiency and cost effectiveness. Indeed IS success extends beyond project success to transformation of the organisation as a whole.

This chapter describes the proposed IS implementation and use framework for organisations. The framework is expected to guide organisations into successful diffusion of information systems. This framework is an improvement of Statnikova's IT implementation model adopted from Kwon and Zmud (1987). The proposed framework is categorized into seven stages: initiation, adoption, adaptation, acceptance, routinisation, infusion and optimization. The proposed IS implementation and use framework is aimed at increasing organisational benefits that are a result of increased utilization and optimization of well-implemented Information systems. This means that emphasis cannot only be placed on the successful implementation of Information systems but rather long term effects of organisational transformation and effectiveness. It is however important to note that this framework has not been tested in any organisation to assess its fitness for purpose. It needs to be reviewed and tested in different live IS deployment processes to assess its reliability.

5.1 Proposed IS implementation and use framework

This framework consists of two major phases broken down into sub-phases. These phases include; Project phase and post project phase. The project phase, which is mainly concerned with the implementation of Information Systems, consists of; initiation, adoption and adaptation. The post project phase includes acceptance, routinisation, infusion and optimization. To transition from a legacy system to a new Information System, the process involves project implementation and more importantly the post-project phases that encourage continued use of the Information System. This framework is an integration of some of the commonly used Implementation and

use models including; Lewin's change model (1947b), Rogers' diffusion of innovation (1983), Kwon and Zmud model (1987) improved by Statnikova (2005), Technology Acceptance Model (TAM), IS success model by DeLone & McLean (2003) among others. Some of the activities in the phases discussed below have been improved using best practices in enterprise architecture adopted from The Open Group Architecture Framework (TOGAF) (The Open Group, 2009). The order of activities in the different phases including the time in which they are started and completed should be adapted according to the situation at hand.

Organization Context

-Understanding strategic goals
- Business process mapping & Re-engineering
- Organization climate
- Work group characteristics
- Job characteristics
- Satisfaction level with current system
- Attitude toward change
- IS department power

- Management Commitment
- Commitment to change
- Resource availability
- Project Champion

- Regularize IS use in org. procedures
- Cooperation

- System as social norm
- Evaluation of progress & Communication
- IS-business ownership
- System as performance measurement

- System improvements
- Greater performance
- Expected benefits
- Staff in charge of problems & Improvement ideas
- Regular audits

Project Context

- Excellent project management
- Document requirements & seek stakeholder approval

- Implementation strategy
- Required technology infrastructure
- Business constraints to project continuity
- Stakeholder engagement plan

- Project team composition
- Project uncertainty
- Extent of implementation planning
- Management support

Facilitating conditions

- IS use policy

Project Context

| Initiation | Adoption | Adaptation | Acceptance | Routinization | Infusion | Optimization |

PROJECT PHASE

POST-PROJECT PHASE

IS Context

Compatibility/Job fit

- Relative advantage /Perceived Usefulness
- Task technology fit
- Complexity
- Results demonstrability
- User satisfaction w/quality of system and information
- Impact on user work environment

IS/task, Org. value & belief fit

Project Context

- Computer training
- Education about the project
- Trialability

- User participation
- User Involvement

User Context

- User attitudes toward computer & innovations
- Computer literacy
- Number of years with organization & in present position

Personal innovativeness

- Resistance to change
- Attitude toward using new technology

- Innovative use of IS features

- Sustained IS use
- Continuance of IS acceptance

- Software mastery
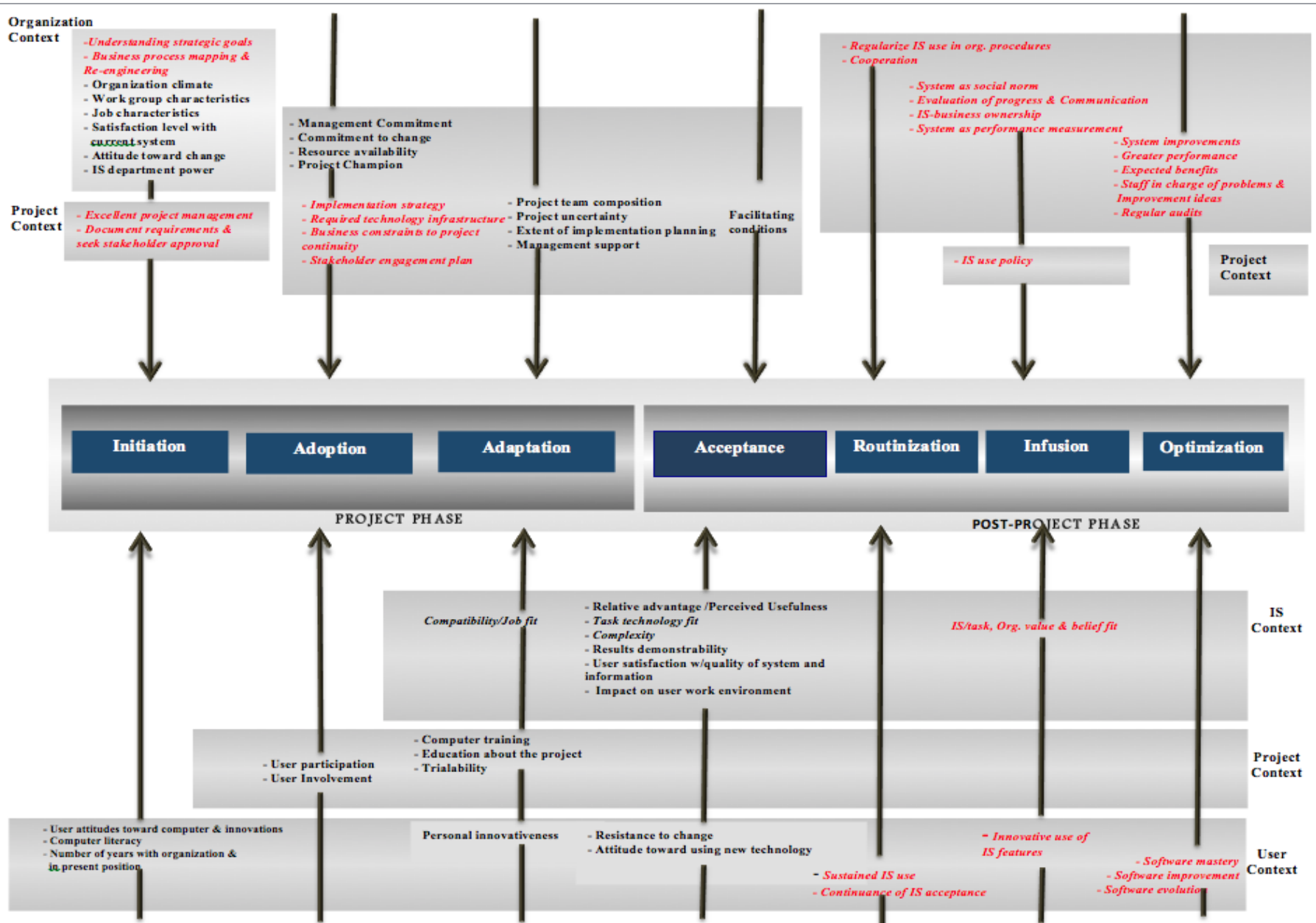- Software improvement
- Software evolution

Figure 7: *Proposed IS Implementation and Use Model.*

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5.2 THE PROJECT PHASE

5.2.1 Initiation

Initiation is the first phase of IS implementation projects. According to Copper and Zmud (1990 cited in Statnikova, 2005), it is the stage for scanning the organisation for opportunities and problems that need IS solution and improvement in task management. This can be a result of technology push or organisational pull. In order to achieve a high level of IS success, there should be a great need within the organisation to improve business processes through the use of Information Technologies. The various aspects that need to be considered during the initiation stage include;

Organisation climate: This deals with the setting in which the new innovation is being introduced into. It involves the organisational culture, goals and strategies, nature of leadership, management relationship with its staff, reward systems, politics and power relations (Kalegai, 2005). Understanding these aspects within the organisation is important for IS success. Not only are these aspects directly linked to continuance, normative (perceived obligation to remain) and commitment (Silverthorne, 2004), deeper understanding of the organisation environment would prepare the implementers to plan better and to overcome any inherent difficulties with new IS projects. On the contrary, if these aspects are not put under consideration, there will be resistance to the IS implementation process.

Understanding the work group characteristics: Individuals learn to perform in an organisation through socialization (Silverthorne, 2004). Studying the social system among employees such as nature of collaboration, job tenure and education is very profitable to the implementation process (Statnikova, 2005). Lewin (1947b) asserts that any change in an organisation should be conducted first at group-level rather that at individual level. This is because the individual cannot be sustained by him/herself and often, returns to the workings of the group. Understanding the nature of the work groups makes it easier to encourage innovation acceptance and to influence perceptions among them. Further, Silverthorne (2004) explains that organisation effort to improve effectiveness, must seek to engage employees from an organisation perspective, which is influenced by IS-work-task-fit, commitment and job satisfaction.

Job Characteristics: The implementation team should also study the job characteristics of the stakeholders that are likely to be affected by the deployment of the new system. Studying the nature of the tasks to be performed, the degree to which a user is independent in carrying out a task and to control the quality of its output is important to the implementation team (Nelson, 1990 cited in Statnikova 2005). If the degree of autonomy is high, it means that the users can make personal choices on learning how the new system works without management interference. Also, the implementer can influence IS acceptance by engaging individual users on system capabilities and expected benefits. Further, management and the project team can use this opportunity to adequately prepare the users for the changes that are to occur during the installation of the new system and to anticipate any form of resistance to the new change.

Level satisfaction with current system: During the initiation phase, it is also important for the new IS implementers to evaluate the level of confidence that the users have with the current system. The implementation team must carry out due diligence to understand the current state of affairs. This means that careful consideration of the level satisfaction of the current system is key. Ika (2009) explains that the success of a project and its results depends on the evaluation and perception of different stakeholders and groups. High level of satisfaction can facilitate understanding the required features for the new system (Statnikova, 2005), which is necessary during requirements gathering and documentation. On the other hand, a low level of satisfaction calls for attention to alternative solutions that can help improve performance (Rogers, 1983). This aspect is important because it enables adequate assessment, or else may lead to wrong system design and implementation.

Attitudes towards change: The introduction of Information Systems in an organisation infers to transition and a need for change. According to Lewin (1947), change is a continuous aspect of organisations and users tend to form different attitudes towards change. Fishbein and Ajzen (1975 cited in Davis, 1989) suggest that attitude is influenced by individual beliefs or perceptions, which affect the intention to perform a certain behavior or task. Knowing user attitude towards change prepares the implementation team to plan for and manage the new Information System acceptance.

IS Department Power: There is also need to understand the influence that the IS department has on decision making within the organisation. If the IS department in the organisation is powerful, then it can influence the type and quality of Information System to be adopted by the organisation. Again, the level of involvement of the IS department and direction is crucial because they are key aspects to systems sustainability, maintenance, including the allocation of computing resources for the project when required to enable IS project success (Statnikova, 2005). Having a powerful IS department can have a significant impact on IS acceptance.

Assessment of computer literacy: Statnikova (2005) observes that assessment of computer literacy among potential system users is a key aspect at initiation because it is directly linked to IS use. Understanding the computer literacy level of users can help determine level of exposure to computing technologies, user confidence in computer use, and define scope for areas that need more support or user training. Statnikova also explains that users with a previous experience and exposure to computers are likely to have a high level of satisfaction with the new IS compared to new computer users.

User attitudes towards computers and innovations: Related to computer literacy, is user attitude towards computers and innovations. Ginzberg (1981b cited in Statnikova, 2005) observes that user attitude towards a new information system and how the user perceives its usefulness is determined in the initiation stage. It is useful to understand users' desire to in-cooperate technology in their everyday tasks as it can be used to predict IS acceptance and eventual use. A positive attitude towards computers and innovation may improve IS project experience while a negative attitude towards computers and innovations may call for stakeholder education of computer/IS use and its benefits to promote potential IS acceptance.

Number of years with organisation and in present position; Here focus is placed on the level of commitment to organisational goals and amount of knowledge related to business processes, tasks and understanding organisation climate that can be useful to the IS project. Users that have served the organisation longer tend to be more committed to the organisational cause and direction (Mucheru, 2013). They can also be very useful in requirements gathering and IS alignment, by explaining how different organisational aspects are inter-related. Moreover, they

can also be studied to understand their influence with in the work groups, attitude towards change and level of enthusiasm or reluctance to use new innovations and technologies.

Ghobbe & Salmasi (2016) suggest that accurate identification of IS Implementation success factors are key and should be done at the initiation of the project. Statnikova (2005) raises great arguments in the improved Kwon and Zmud (1989) IT Implementation model. However, we believe that in spite the inclusion of these aspects, Statnikova's improved IT Implementation model can further be extended. There are missing aspects that can be added to Statnikova's IT Implementation model that are pertinent to the different stages of Implementation and use. At the initiation stage we choose to add *Understanding of organisational strategic goals, excellent project management, Business process mapping and re-engineering, documenting requirements and seeking stakeholder approval*. By adding these constructs to the IT Implementation Model, we extend Statnikova's improved IT implementation model. These constructs are described here under.

Understanding strategic goals: One of the most instrumental approach to stakeholder analysis in IS projects, is to address the aspect of the development of an information system strategy and its alignment to business strategy (Dwivedi, Wade & Schneberger, 2012). Strategic goals of an organisation can be geared towards global efficiency, local responsiveness, cost effectiveness or transfer of learning. Understanding these goals is important to Information system delivery. Bashel and Irani (2010) suggest that strategic analysis helps focus on the contribution of the IS on core business processes, organisation vision and mission, including alignment with IS goals. Tarhini, Tarhini & Masa'deh (2015) studied the critical success factors for ERP systems implementation in organisations. They explain that a clear definition of organisation's strategic goals would help in building a system that effectively support the capabilities of the organisation.

Excellent project management: Another aspect that should be considered at initiation is investigating if the organisation has an agreed upon project management methodology. Ghobbe & Salmasi (2016); Schwalbe, (2011); The Open Group (2009) and Atkinson, 1999 note that it is important for organisations intending to implement new information systems to first review or develop an organisation implementation framework, align it with project goals, develop of an

implementable roadmap for the project through top management involvement including constraints, risk identification and mitigation. According to Kanaracus (2008), excellent project management means that a project is finished on time and within the assigned budget. This is important because it helps to enhance business continuity, quickly delivers benefits and meet organisation objectives as success measures. Also important in project management is the selection of an experienced project manager and a project team that has significant previous work relationships (Sumner, 1999). Other practices include effective project planning and compatibility of the skill-set with the skills needed for the project requirements.

Business process mapping and re-engineering: This aspect has been added at initiation phase because most often, there is benchmarking of technology rather than actual business process mapping. Organisations find a working system in a different setting and make the assumption that it will work for them in spite the difference in work processes and task management. Tarhini, Tarhini & Masa'deh (2015) note that prior knowledge of organisation business processes is important to the IS project team before they can be aligned with the processes within the system. Systems must be developed around the specific organisational processes and tasks rather than aligning or changing the business processes to suit the technology. Horine (2005) argues that IS alignment with organisation goals is key to IS success. In the event that the current business processes of the organisation cannot be supported by the new system, efforts should be made to reengineer the organisational business processes to align them with those within the system.

Ghobbe & Salmasi (2016) and Sumner (1999), note that improving or re-engineering business processes before the implementation of new IS solution is a critical success factor for IS projects. Auer (1998) observes that organisational norms, routines and practices direct individual actions, resulting into cumulative IS use to support organisational goals. Thus Business process re-engineering must be done as an interactive approach between the implementation team and the individual users as well as the organisation as a whole during the initiation phase.

Documenting requirements and seeking stakeholder approval: The Open Group (2009); Ghobbe & Salmasi (2016); Belout and Gauvreau (2004) and COBIT (2007), discuss the need to

identifying and documentation of IS requirements at initiation. However, it is important that the implementation team seeks top management approval of the identified requirements. This helps in establishing ownership and IS acceptance. Belout and Gauvreau (2004) also note that all requirements for system implementation must be considered if there is to be IS success. It is crucial to clearly define and document the IS success and measurement factors at the beginning of the project because they help to guide the implementation of the project (Thomas & Fernández, 2008).

5.2.2 Adoption

Adoption is a critical stage of IS projects because it is where the organisation has given the IS project a go-forward. At this stage, the implementation team plays a strategic role of ensuring positive organisational support, negotiations with management and other key stakeholders to obtain sufficient resources for the IS project. Further, it is important to engage the users and gain their interest in the new system, establishing an environment where they are encouraged to participate in order to build ownership. In Statnikova's IT Implementation Model, six aspects are highlighted as being key to the adoption phase. These include, management commitment, stakeholder commitment to change, resource availability, role of a project champion, user involvement and participation. In our improved model, we add the need to *establish an implementation strategy*, *define required technology architecture,* d*etermine business constraints to project continuity* and *develop a stakeholder engagement plan.* By identifying these factors, and assigning them to the adoption phase, we extend the Statnikova's IT implementation model. These aspects are discussed here under.

Management commitment: Ghobbe & Salmasi (2016) cites management commitment as one of the most influential factors in the implementation and use of Information Systems. Management commitment is pertinent in ensuring clear direction in IS implementation, availing necessary resources for IS project, creating organisational awareness and leadership. Shao, Fang & Hu (2015) and Dorsey (2005) also emphasize the role of management involvement and support in the implementation of Information Systems. They contend that IS projects are prone to serious setbacks and therefore there is need to seek the involvement of management as it can help to

avert any possible crisis. Thus, management commitment is demonstrated by addressing all implementation issues and related activities (Maarop et al. 2015).

User involvement and participation: Bano & Zowghi (2013) and Zafar (2010) identify user involvement and participation as a key component of the adoption phase of IS projects. User active involvement at adoption helps to ensure that their hardware and software needs are met (Zinatelli, Cragg & Cavaye, 1996). It allows for users to make adjustments to the system so that they are satisfied with its capabilities, which minimizes resistance and increases satisfaction. Increased satisfaction with system capabilities, also leads to a more participatory approach by the users.

User participation can be used to predict IS success. This is so because users go through many significant phases of change during IS implementation (Statnikova, 2005) and most times, they see change as a threat in terms of job security, autonomy and power. Thus, getting them to participate in IS project process helps to influence their attitude towards the system since they can quickly apply it to their routine work and find no threat. It can also help to gain their commitment to the IS which builds ownership and a desire to see the project succeed. Also important to highlight is that management plays a major role in influencing users into engaging in IS implementation process. Management has to be vigilant in communicating the urgency and purpose of the new IS. If this is not done, the users may view the new Information System as an optional task (Whittaker, 1999 cited in Watson, 2007).

Stakeholder commitment to change: As organisations transition from IS installation to full realization, they need to create sustainable adjustment in mindset and behavior. These adjustments may not happen immediately or follow a predictable pattern and usually need to be well planned and supported. Ginsberg (1981 cited in Statnikova 2005) explains that in organisations where staff are reluctant to embrace change, securing management and user commitment should be done right at the beginning of the project in order to achieve success at adoption and other stages. Management must understand how useful the new system is and believe that it will improve the organisation's performance. Equally, users' commitment to change helps in setting the atmosphere in which the system will work well. Ultimately

organisational stakeholder commitment to change enhances their participation in project implementation processes, builds ownership and responsibility towards project outcomes and IS usage.

Resource availability: When management is committed to change, they will make available sufficient resources for the IS project. Resource availability is pertinent at adoption since it affects the level of stakeholder engagement and quality of IS project. Resources range from finances, personnel, equipment, time and implementer's skills (Statnikova 2005). Statnikova (2005) emphasizes that resource availability alone is not sufficient, but must be of good quality in order for them to effectively contribute towards IS project success. DeLone and McLean (2003) contend that IS quality largely contributes to user satisfaction and system use. This means that system quality must start at the 'production stage' where quality of skills and resources are used in development and implementation.

Project champion: Several authors emphasize that the quality of change in an organisation is highly influenced by the presence of a project champion (Tarhini et al., 2015; Soja, 2006; Shatat & Dana 2016). A Project champion is a highly enthusiastic person within an organisation that is committed to the new innovation (Premkumar, Ramamurthy & Crum, 1997). The project champion plays a number of roles in managing change such as influencing user attitude and over coming resistance. A Champion also promotes and creates awareness, giving a favorable impression of the new system among users. Champions work towards ensuring that there are enough resources available for project implementation. It is therefore important that a project champion is identified early enough most especially at the IS adoption stage.

Establish implementation strategy: Bouman et al. (2005) and Ahmad & Cuenca (2013) have identified Implementation strategy as a critical success factor in IS implementation process. The main objective at this stage is to generate a project strategy that encompasses the overall implementation and migration strategy including a detailed implementation plan *(The Open Group, 2009)*. Implementation of a chosen strategy deals with communicating the strategic option to all involved stakeholders. This is decided at top management level and communicated to other levels of the organisation. It is important to have a well-articulated strategy in place to

define the change initiative and map out a plan towards the implementation. The implementers discuss with management if it will be a phased approach or an abrupt-cut-over approach. They can choose to develop actionable steps on how to deliver this strategy using a road map. It is however important to add that an implementation strategy developed at the adoption phase should reflect the way the business is organized and structured (Combe, 2006).

Define required technology architecture: Information systems are supported by various technology infrastructure and platforms. There is a need to ensure that the technology that is required to facilitate the new Information system is compatible, available, and accessible to all stakeholders throughout the organisation. The Open Group (2009) observes that with the emergence of Internet technologies, many organisations have placed emphasis on application software rather than application platforms. However it is important to note that application platforms and other technology infrastructure are critical in the choice of IS development and the degree of compatibility with other systems. Identifying the needed infrastructure requirements and how the different infrastructure components are inter-linked critical in IS implementation.

Determine business constraints to project continuity: These are usually drawn within the business case where all the possible drawbacks, constraints and risks towards project continuity are identified *(The Open Group, 2009)*. Despite prior planning, IS initiation normally presents several challenges and constraints that the Implementation team and the organisation need to be aware of (Rogers 1983). These can include; limited budget given degree of IS implementation, competing priorities within the organisation, difficulty in persuading people towards change and new system, insufficient technology support and employee hesitation in participation in IS implementation (Wanjau, Macharia & Ayodo, 2012; Kaur & Aggrawal, 2013). It is important to define and articulate the constraints that must be dealt with, and secure formal approval to proceed with the project. Identifying these aspects is useful in project control and establishing organisational commitment and support in strategic IS initiation (PMBOK, 2013).

Stakeholder engagement plan: Stakeholders are internal organisational groups who are affected by the activities of the project (PMBOK, 2013). They support the business environment in which the project is to be executed and thus are affected by the on goings of the project. Since there is

usually interaction between the stakeholders and the project team, stakeholder engagement is key in obtaining Information System requirements and acceptance of project deliverables. Hence, for a smooth transition, the implementation team must establish a stakeholder management plan, which will include a communication strategy, identification of most influential stakeholders and stakeholder power grid (The Open Group, 2009).

5.2.3 Adaptation

The concept of IS adaptation deals with the integration of the new system into a better organisational fit. In order for the system to be fully implemented, the project team will engage in installation of the new system and modifying a few features. The users will move from adoption into adapting the new system for specific tasks. Users start exploring system features and making the system a part of the routine. Still, management continues to work towards actively establishing a supportive environment for IS implementation. In this phase, this study adopted all the constructs defined in Statnikova's IT Implementation model. These constructs are discussed here under.

Extent of implementation planning: Thorough implementation planning is crucial at adaptation because all issues that can encumber the project process must be identified and addressed. Management should be able to appreciate the progress of the system implementation and, users desire to start using the new system should be encouraged. Statnikova (2005) describes the importance of clear definition of the project and planning, in reducing any form of *project uncertainty*. This according to Statnikova (2005) should be done through proper assessment of organisational needs, system-task fit, training requirements, evaluation criteria and assigning specific roles to the project team members. 'The more thorough the planning effort, the less likely are unforeseen circumstances which could endanger the project' (Ginzberg, 1981b cited in Statnikova, 2005).

Management support: Razali and Vrontis (2010) studied employee reaction toward the implementation of a Human Resource Information System as a planned change program in Malaysia. They concluded that top management visibility was critical in acceptance of a planned change program. The authors explain that *management support* includes active management

involvement in implementation committees, management consistency and supervisory support. Statnikova (2005) observes that organisational aspects such as workflow procedures, routines, and reward system, control and coordination mechanisms affect users ability and motivation towards successful systems adoption. Therefore, users need to see management's active involvement in the system implementation process to encourage users adaptation to new system changes.

Personal Innovativeness: Agarwal and Prasad (1998 cited in Statnikova, 2005) affirm that personal innovativeness has a strong positive influence on user perception of system compatibility and system adoption. Perceived System capability is directly related to perceived usefulness. Davis (1989) studied the influence of perceived usefulness on user acceptance of information technology. The author found that the degree to which users believed the system to be advantageous, especially in increasing their performance or capability influenced their acceptance of that system. This means that the more innovative users interact with system features, the more they discover its benefits. Thus, management must encourage personal innovativeness among users. Also, understanding the level of innovativeness among users is important in motivating the less innovative users and turning the more innovative ones into project-champions.

Compatibility/job fit: The project team should strive to ensure that the capabilities of the new system are closely aligned with existing organisational values, norms, previous work experience and organisational needs. Similarly, system features should be properly aligned with the different job practices and tasks. The system must be capable of supporting the various tasks while increasing user work performance. The closer the system *compatibility/job fit*, the more likely the system will be adapted. Compatibility has been said to be a strong predictor of Information systems usage (Rogers 1983). Users must believe that the new system will support the various routine tasks with less effort. Rogers (1983) affirms that an innovation that is not compatible with organisation values, user values, beliefs and needs will not be adopted.

Computer training: It has been found that training users in relevant computer skills is necessary in achieving optimal IS effectiveness (Al-dmour, Love & Al-Zubi, 2013). Proper and adequate

training is important in overcoming usability challenges, improving end user experience and enhancing efficient and correct system use. The Implementation team should conduct computer-training sessions with focus on end users middle and top managers. Training programs can include actual computer use, storage, security and computer applications that support day-to-day organisational tasks. This is important in enhancing existing capabilities as well as acquisition of new skills. Combaz (2015) asserts that user readiness to use Information technologies is crucial to IS success.

User training in new procedures and IT applications: Al-Mudimigh, Zairi & Al-Mashari (2001) observe that users need to learn the different system functions that are related to their work, and must acquire sufficient information to be able to understand the new processes and procedures. In addition, users need to understand how the introduction of a new system will affect their work during and after implementation. Hwang (2014) studied the effect of top management support and training on IS success, the author found that training of users has a direct effect on user satisfaction and with the system. Training of users not only enhances competency levels but influences speed and coverage of system adaptation process (Warren, 2004). Statnikova (2005) notes that lack of such training will increase user resistance to the new system, lack of participation as well as system dis-ownership.

Trialability: Rogers (1983) observes that the extent to which an innovation can be tested on a limited scale *(trialability)* plays a key role in user adoption of a new innovation. The author argues that new innovations that can be tried within an installation plan are more quickly adopted. Having a 'dummy' system for users to test and experiment upon can help users to get familiar with system capabilities, without worrying about making mistakes with actual organisational data. Information System *trialability* helps to reduce risks and uncertainty of unexpected system use consequences and outcomes. Further, it enables users to become comfortable with the system, which increases the possibility of its adoption (Karahanna, et. al. cited in Statnikova, 2005).

Project team composition: The project team competence is a critical success factor in IS project implementation (Tarhini, Tarhini & Masa'deh, 2015; Soja, 2006). The implementation team

should have multiple skills and experience as a move towards building a strong relationship between the users and implementers. The right skills-set includes, IS knowledge, inter personal skills, computer skills and knowledge about the different organisational areas. This helps to build user confidence in the team's ability to implement a quality system. According to Shatat & Dana (2016), the success of the IS project relies on the skills and knowledge of the Project team members as well as the experience of the project manager. Forming the right team with members who have a deep understanding of the organisational business processes is crucial during IS implementation.

In summary, the Adaptation phase encompasses system development, installation and maintenance (Beaudry & Pinsonneault, 1999). It also focuses on IS implementation aspects which are consistent with shaping organisational culture, norms and practices. Further, it includes the diffusion of Information System use through a shift of the nature of work to the use of new the technology. Systems features are carefully made to suit the business context in order to effectively utilize the system and successfully transfer their core business values through the entire organisation. This stage also requires sustained organisational support that transitions to the next stages of system Acceptance.

5.3 POST-PROJECT PHASE

Tennant (2014) studied the post-adoption stages i.e. *Acceptance, Routinization* and *Infusion* that occur after an innovation has been introduced to the organisation. Post-adoption use of new Information Systems involves user behavior in relation to adoption decisions, use behavior, IS extension behavior in accomplishing various tasks. Tennant (2014) notes that individual use of Information System is the basis for long-term productivity and gain in organisations. On this basis, *Optimization* has been added to the Post-adoption phases. Govindaraju (2012) studied the implementation of Enterprise systems in organisation and noted that system optimization is key to any IS post-adoption process. It is however important to note that even in organisations where IS use is mandatory, individual users tend to engage in basic-level use of features of Information Systems. This form of IS underutilization is a major concern that hinders exploiting the benefits at workplaces.

5.3.1 Acceptance

At acceptance, efforts are made towards engaging organisation members to commit to use of the new system. Here, users have started to use the technology and they are able to evaluate its characteristics, how it affects their performance and decide on whether to continue using the system (Cooper and Zmud, 1990 cited in Statnikova 2005). Statnikova (2005) identifies nine constructs that must be considered at the IS acceptance phase. They include; Resistance to change, attitude towards using new technology, impact on user work environment, user satisfaction with quality of system and information, result demonstrability, complexity, task technology fit, relative advantage/ perceived usefulness and facilitating conditions. This study adopted all the constructs defined in Statnikova's IT Implementation model during acceptance phase. These constructs are discussed here under.

Resistance to change: Resistance to change is a common reaction because of the changes that affect organisational values, belief, infrastructure and users sense of self. Leclercq-Vandelannoite (2014) investigated the implementation of a Geographical Positioning System in a French mobile phone and Internet service provider company. They found that dissonance within the organisation was majorly responsible for dis-identification with the system, which strongly contributed to user resistance. Also, some staff felt that the system constrained them and was used to define whom they were and as a result were not keen on using it. User resistance often is a reflection of a much bigger problem such as an un-identified system fault, IS-task compatibility problem, an IS-organisation value, belief issue or employee's sense of self. Thus cause of resistance can help the implementation team in addressing these problems to enable success. Lauterbach & Mueller (2014) observe that recurrent interaction with the technology in question can be used to guide future use of the IS. They add that resistance is overcome when users work around certain functionalities and deeply deploy the technology in their routine tasks.

Task-technology fit: Task-technology fit considers technology characteristics, their influence on organisation task and how they determine user acceptance of a given system. Goodhue & Thompson (1995) studied factors that relate to IT use and task performance. They found that for IT use to have a positive impact on task performance, there has to be a good fit between the technology and the tasks it supports. In addition, the authors observed that IS have a positive

impact on organisation performance if their features and functionality correspond with user requirements. Goodhue (1995 cited in Statnikova, 2005) observes that the value of the technology is dependent on users view of how the system assists or hinders their ability to adequately perform their day-to-day tasks. Hence, task-technology fit is a key aspect that needs to be re-evaluated after the system has been adopted in an organisation. The more compatible and usable the system is in meeting the user task needs the more quickly it will be accepted.

Perceived usefulness: Perceived usefulness has been discussed by DeLone and McLean (1993) as a predictor of IS success. Similarly, Davis (1989) contends that perceived usefulness is key in understanding user intention and actual system use. Davis defines Perceived usefulness as 'the degree to which a person believes that using a particular system would enhance his or her job performance'. Statnikova (2005) goes ahead to relate perceived usefulness with *Relative advantage.* According to Rogers (1983), relative advantage 'is the degree to which an innovation is perceived as better than the idea it supersedes'. This can be in relation to financial outcomes, convenience and satisfaction with the system. Rogers ascertains that as long as the users perceive the new system to be advantageous, they are more willing to adopt it. The Implementation team must conduct a survey to assess user perception of the IS usefulness and relative advantage. This is important in determining what changes should be made to make the system more acceptable. Thus the higher the relative advantage, and perceived usefulness the quicker the degree of IS acceptance.

Attitude towards new system: The deployment of a new system affects various business processes and the users directly. These changes affect the nature of work during implementation of new systems and, users develop an attitude towards the new system. Understanding user attitude towards a new system is important for the implementation team to strategically plan on improving IS acceptance. Investigations can be carried out through focus group discussions, observation and involving behavior experts in assessing user attitude towards new systems. Venkatesh and Davis (2000) studied the effect of perceived usefulness and perceived ease of use on attitude towards system use. They explain that high levels of perceived usefulness and perceived ease of use influence positive attitude towards the new Information Systems and their acceptance while low levels of perceived usefulness and perceived ease of use will influence

negative attitude towards the new IS. Thus, it is important to understand how the new system is perceived by users if their attitude towards IS acceptance is to be influenced.

Complexity: This deals with understanding the characteristics of the information system and how it is to be used. According to Rogers (1983), complexity is the degree to which a new system is perceived to be easy to understand and use. While some system are usually easy to understand, some are more complicated and often take time to be accepted in organisation. Understanding user perception of IS complexity can be useful in designing strategies that can make the system easy to use. The more the system is perceived to be difficult to understand, the less likely it will be accepted. Lower levels of complexity help to anticipate high acceptance rates and realizing system benefits

Results demonstrability: Results demonstrability has a great impact on users acceptance of information systems (Grubljesic, Coelho & Jaklic, 2014). IS use is often voluntary and its benefits are indirect and more visible in the long term. Users acceptance of information Systems is influenced by their belief in tangible benefits or demonstrable recognition of those benefits. Iivari (1995) proposes that result demonstrability has observability at its core. Roger (1983) in description of system observability notes that the easier it is for users to see the results of a new system, the more likely they are to adopt it. This kind of visibility stimulates work group discussions about the new system, which increases possible acceptance. Higher result demonstrability will also facilitate easier assessment of system-task compatibility (Iivari 1995). Implementation teams need to show value of Information systems by sharing prototypes with key stakeholders in order to increase acceptance.

System quality and *Information quality:* User satisfaction is directly linked to the quality of information in the system and system quality (Kerta & Suryawan, 2013 & DeLone and McLean, 2003). System quality has been said to include ease of use, convenience of access and system reliability. High level of system quality leads to increased use and user satisfaction. Similarly, the higher the quality of the information, the more the system will be used and the more the users will be satisfied with the system. According to Bharati & Chaudhury (2006), Dwivedi, Wade, & Schneberger (2012) and Bossen, Jensen & Udsen, (2013), Information quality implies that

information produced by the system is relevant, accurate, complete, timely and that it contributes to decision-making and user satisfaction. It is thus important to put these aspects into consideration when deploying new system. When users are satisfied with the system quality and information quality, then it will easier to obtain their commitment to IS use.

Impact on user work environment: The introduction of a new system may change how users work and their performance. In evaluation of the impact of a given technology, three things must be studied; task performance effectiveness, group interactions and performance processes and, user reactions to the system and its results (Baker, 2004). Understanding how the new IS impacts work tasks and relationship patterns is important and must be assessed. How the new system affects users' work environment in terms of job satisfaction, inter-personal relationships and internal communication is important in predicting IS ownership and acceptance. It can also be used to create a conducive environment for IS acceptance (Statnikova 2005) and a step towards better IS related change management to leverage the IS full potential and add real business value (Lauterbach & Mueller, 2014).

Facilitating conditions: Venkatesh et al. (2003), studied user acceptance of new technologies and found that facilitating conditions, affect perceived usefulness and actual system use. The authors suggest that facilitating conditions infer to resources needed to use the system, knowledge needed to use the system, system compatibility with other systems and availability of support and assistance in times of system difficulty. Tompson et al. (1991 cited in Statnikova, 2005), describes facilitating conditions as the extent to which a user believes that the organisational and technical infrastructure exist to support the use of the system. Management and the IS project team must address the issue of facilitating factors as a measure towards positive IS acceptance and continued use among targeted users. This is important in increasing system use and behavioral intention in utilizing the system.

5.3.2 Routinization

Routinization is a consequence of repeated execution of a behavior. It involves the alterations that occur within the organisation to account for the Information System so that it is no longer perceived as new (Beaudry & Pinsonneault, 1999). At routinization, the focus in mostly on

organisational commitment to system use by management and staff. Zmud and Apple (1989 cited in Touheed et al., 2013) observe that routinization stage must be reached for an information system to be deemed as successful.

Sustained use and continuance of IS acceptance: Hsieh and Zmud (2006) observe that IS success at routinization is achieved from sustained use and continuance of IS acceptance. Sustained use is often coupled with spontaneity of actions that are directed by strong intention to use the system. Sustained use leads to routinization. Touheed et al. (2013) note that sustained usage is more important because at initial use, users may change their intention on using the system in the future after first time acceptance. Management should work towards encouraging repeated use of the system through sensitization, use of reward system and establishment of policies that compel users.

Regularize IS use in organisation procedures and behavior: This deals with the degree to which the new Information System is stable and the rate at which it becomes a regular part of organisation procedures and behavior. Tennant (2014) observes that at routinization, 'the organization's governance systems are adjusted to account for the IT application'. Through continued use of the system, users knowledge and experience from previous IS implementation stages gives them the potential to use the system in a more comprehensive and sophisticated way (Heish & Wang, 2007). Andersen (1995) suggests that recruiting, training and rewarding more innovative individuals may stimulate organisational change, which may result into regular use of the new Information System.

Cooperation: Ahmad & Cuenca (2013) have cited cooperation as a critical success factor at routinization. The extent of coordination among the different stakeholders has an impact on how often employees make use of an information system to deliver organisational goals. High levels of coordination increase motivation levels in using the system. Equally stakeholder cooperation enhances IS problem solving, information sharing and quick decision-making in terms of IS related work procedures and tasks. Employees who consider themselves as part of a team tend to communicate well which has a great effect on overall performance. In a team-oriented organisation culture, team members tend to work towards organisational goals placing these

objectives ahead their own (Laudon & Laudon, 2012). The authors also note that management championship is key at this stage in emphasizing cooperation and teamwork through their involvement. When top managers encourage teamwork within an organisation, employees feel more secure and this increases their desire to achieve the strategic goals of the organisation. There is increased productivity, quality output, increased innovativeness and financial performance (Laudon & Laudon, 2012). Another aspect of cooperation is to identify and encourage opinion leaders to champion increased IS use.

Thus, at routinization, there should be a high degree of creativity that enhances users cognitive resources to develop new ideas and the ability to implement them in their work processes.

5.3.3 Infusion

Infusion is described as the advanced state of routinization where the Information Systems are deeply embedded and extensively used within the work system by an individual or organisation (Beaudry & Pinsonneault, 1999). It also infers to the level to which the full potential of an innovation is integrated in the organisation' processes, for operation or managerial work including the depth of integration. Saga and Zmud (1994 cited in Hsieh & Zmud, 2006) argue that users can only transition to Infusion through direct use experiences with the IS and continuous learning to obtain capability. When users go beyond routine and standardized use, they achieve a higher level that allows them to exploit the full potential of the system, resulting into positive consequences (Cooper and Zmud, 1990 cited in Heish & Wang, 2007). In our view, some of the practices to be performed at infusion include; *acceptance of system as social norm (*Lauterbach & Mueller, 2014), *evaluation of progress and communication (*Ahmad and Cuenca, 2013), *IS use policy formulation, support IS as new culture, formalization of work procedures*, *use of System for performance measurement and IS-business ownership (Govindaraju, 2012), IS/task, Organisational value and belief fit* (Beaudry & Pinsonneault, 1999) *and Innovative use of IS features is encouraged* (Hsieh & Zmud, 2006). These aspects are discussed here under.

Acceptance of system as social norm: Lauterbach and Mueller (2014), cite acceptance of system as social norm as a characteristic of infusion stage. Acceptance of the IS as a social normal can be done through continuous improvement of the systems to meet the organisational needs.

Addition of new capabilities that are aligned to organisational culture can also increase deep use of the system. Govindaraju (2012) observes that at infusion, there is deep and comprehensive embedment of IS within the individual and organisational work system as a new culture. Also, organisational support for new IS tool as a culture is strong at this stage as it ceases to be an innovation but rather an accepted social fact (Govindaraju, 2012). The Information System is no longer viewed as out of ordinary but becomes part and parcel of individual behavior routine (Lauterbach & Mueller, 2014).

Evaluation of progress and communication: Ahmad and Cuenca (2013) identified these aspects as critical success factors at infusion. Beaudry & Pinsonneault (1999) extended the theory of IT infusion in organisation. They concluded that when IS infusion levels are high, IS use will be associated with improved performance while low infusion levels will have no significant effect on individual or organisational performance. Attention thus should be placed on evaluation of IS use progress and giving feedback to achieve optimal results from routine use. Enhanced communication has a strong influence on overall performance of the organisation. According to Hornstein (2008), employee resistance to system use is often a result of insufficient communication about the scope of change, training implications and potential impact on role changes. Management must endeavor to effectively communicate these aspects by engaging staff in the visioning process. They should also encourage them to participate and contribute towards organisational goals including the creation of internal change agents to facilitate communication between management and staff.

IS use policy formulation: Information systems and are important assets. (GRIPS, 2012; GFI, 2011). The authors note that failure to protect these assets can lead to stagnation in an organisation. They also note that in order to encourage the employees to give constant efforts to properly manage and use these information assets, there is need to establish an organisational policy to promote the understanding and importance of their security and proper use. Formulation of IS use policy is also consistent with Govindaraju (2012) assertion of the need to formulize work procedures. Tennant (2014) observes that higher levels of infusion are possible when users are in a stable working set of routines. Infusion occurs when the IS becomes more

deeply embedded within the organisational work groups or individual tasks (Beaudry & Pinsonneault, 1999).

Use of system for performance measurement: Govindaraju (2012) suggests that when the system has become institutionalized within the organisation, there should be changes in performance measurement systems. Performance measurements can be in relation to business process efficiency, customer satisfaction or employee training (Laudon & Laudon, 2012). Sustained use of information systems should enhance the organisations' ability in achieving such strategic goals. Management is expected to encourage proper use of new system to support all level aspects of work. This can be done through use of automated customer relationship management tools and surveys to measure customer satisfaction. They can also put in place a mechanism to monitor the time it takes for business processes to execute, as well as conducting regular assessments and appraisals to evaluate employee skillsets in relation to IS use.

IS-business ownership: IS-business ownership is a facilitating mechanism at infusion (Govindaraju, 2012). The Open Group (2009) emphasizes the need to identify business processes and tie them to ownership, usage and business value as a business led strategy. Vital wave consulting (2009) observes that successful IS projects require careful business process analysis and a sense of ownership from all key stakeholders. Vaughan (n.d.) notes that individuals who become involved with a project in a meaningful way develop a sense of ownership to the project and are committed to it. Although ownership is a key aspect that is initiated at IS project inception, at infusion it should be much more intensified through workshops and trainings, including formal and informal retreats.

IS/task, organisational value and belief fit: Cooper and Zmud (1990 cited by Beaudry & Pinsonneault, 1999) found that lower levels of infusion were dependent on compatibility between the given tasks and given system. In contrast, higher levels of infusion were linked to individual belief system and self-interest, organisation culture, values and power relationships, rather than the task technology fit. Beaudry & Pinsonneault (1999) observed thus that higher levels of infusion require implementing changes within the whole organisation. Implementation

of such changes can be done through policy formulation, assignment of roles and responsibilities and use of incentives.

Innovative use of IS features is encouraged: At infusion, users should be able to deeply deploy technology in their everyday practice and in some parts engage the system up to its full potential (Hsieh & Zmud, 2006). In the same vein, employees often learn new system capabilities that exceed the maximum capacity indicated by the implementers. Saga and Zmud (1994 cited by Hsieh and Zmud, 2006) discuss the concept of 'extended use' as a level to which users apply the technology for more comprehensive tasks as a feature of infusion. Schwarz (2003 cited by Hsieh and Zmud, 2006) identified the concept of 'deep use' as a degree to which more IS features are used to support various tasks. Other stages of use at infusion include 'emergent use' where technology is used in ways not prior known at implementation and feature extension where users learn new ways of applying the technology much more than the system designers and implementers are aware of (Hsieh & Zmud, 2006). Management needs to encourage users to extensively apply the various system features to sort out organisational challenges. They can also put in place a reward system to encourage users to develop new ways of utilizing the Information System. In general, at infusion, there is a sophisticated use of the IS and nature of support for tasks that was not prior known of the application.

5.3.4 System Optimization

System optimization focuses on continuous improvement of the system for routine operations and to ensure that the expected benefits are realized. According to Sundaram et al. (2007), system benefits are realized from the degree to which the user has in-cooperated the system in routine tasks. Also, the benefits are dependent on the level of optimization with which the user relates to the system in reaching its fullest potential. In addition, users and managers continue to evaluate the current system in relation to changes in the business and optimization efforts (Govindaraju, 2012). Botta-Genoulaz and Millet (2005 cited in Govindaraju, 2012) cite software mastery, improvement and evolution as key practices at optimization. Grabski, Leech, and Lu (2000 cited in Govindaraju, 2012) cite Regular audits and workshops and existence of staff in charge of problems and improvement ideas.

System improvements: At optimization, management must examine available information management approaches through an understanding of various aspects: To start with System security Schilling and Werners (2015) explain that information systems and the information they hold is of significant value to the organisations. It is the role of the organisation to ensure that it is protected. The authors note that to achieve high level security, there have to be available knowledge, recommendations and guidelines that are to be followed. An, Bouvry and Tao (2008) observe that in system development, there has to be knowledge formalization through the use of models and simulations with the main goal of addressing the concepts of system complexity and ease of use. The internal systems improvement team must study system response time to improve work services enhance quick maneuvering, turnaround time and system availability. Wierschem & Brodnax (2004) observe that system improvements in terms of computer speeds have a positive impact on end-user productivity in relation to amount of work completed. of the evolving business needs. Such optimization can be achieved only in a continuous-improvement.

Expected benefits: Sundaram et al. (2007) and Suleiman, Gomez & Kurzhöfer (2013) suggest that optimization enables organisations to realize system benefits. At Optimization, organisation barriers towards deep IS use for work procedures must be managed. The benefits of Information Systems can be linked to significant cost savings, more efficient flow of ideas and quicker decision-making among others. According to DeLone & McLean (2003) the measures of IS effectiveness within the organisation comes down to six categories. These include IS infusion measures (organisational impacts), market measures, economic measures (organisational impacts), usage measures (system use), perceptual measures (user satisfaction) and productivity measures (individual impact – decision making, performance, job effectiveness & quality of work). Laudon and Laudon (2012) observe that good project management is essential in ensuring that the system is delivered on time, on budget and that it provides genuine expected benefits.

Greater performance: Hsieh and Wang (2007) observe that while at the beginning users struggle to use system functions, overtime, they find additional features that are useful and thus extend system use. The more familiar they become with the system, the more they transition to 'deep use'. Hsieh and Wang (2007) describe deep use as the extent of use of the different technology functionalities or using more functions within the IS. The authors content that this level of

extended use is meant to support the IS user in improved task performance for both existing tasks as well as more comprehensive set of work tasks. To achieve greater performance both at individual and organisational level, management must create a conducive environment that is composed of IS user support, facilitating conditions such as computing infrastructure to encourage extended use of IS features.

Existence of staff in charge of problems and improvement ideas: Grabski, Leech, and Lu (2000 cited in Govindaraju, 2012) cited this aspect as an important step during optimization of systems. Laudon and Laudon (2012) suggest that management can build new organisational roles and responsibilities including dedicated staff positions such as knowledge managers. Besson & Rowe (2012) note that when exploration slows down, the first goal is to stabilize the practices and inform the stakeholders that new, efficiency routines are being put in place. This is important because the organisation needs to be aware on the new aspects so as to refine their routines.

Software mastery, improvement and evolution: High levels of optimization require high levels of both routinization and infusion. Govindaraju (2012) notes that at optimization, there is increased software mastery by the different stakeholders, increased improvements in system functionalities by the internal development and support team as well as system evolution. IS optimization is a never-ending process. Continuous improvements and new developments are important in realizing the full potential of the technology. With increased software use and mastery by target users, management can take advantage of innovative and reliable application to enable the internal system development team to focus on business processes optimization of system capabilities.

Regular audits: According to Grabski, Leech, and Lu (2000 cited in Govindaraju, 2012), regular IS audits should be carried out as a measure towards optimization. Laudon and Laudon (2012) emphasize the need for organisations to conduct comprehensive and systematic audits. For increased success, organisations have to continue to transform and respond consistently to improving existing systems in a bid to achieve high returns from IS investments. In addition, systematic documentation of system improvements and realised milestones is essential. Information Systems cost benefit analysis coupled with regular audits help in ensuring that the

system is meeting business needs and also to find any gaps that need improvement and re-development.

5.4 Conclusion

This chapter discussed the different components of the proposed Information System implementation and use framework. The framework was broken down into two major phases namely the Project phase and the post-project phase. Chapter six goes ahead to present the conclusions and recommendations of this study.

CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.0. Introduction

The use of Information systems to support businesses processes in organisational facets is a growing trend. While this is true, the quality of their implementation and use still needs to improve. The implementation of these systems is bogged down by organisations that fail to have a clear path for systems implementation and use. This study was based on the gap identified by previous researchers about the failure of organisations to benefit from information systems invested in, specifically the question raised by Lauterbach & Mueller (2014); 'What do individuals in organizations actually (need to) do (when and how) to create value when adopting and using Information Systems?' The question included concern about the implementation failure and the influencing role of organisation within which the IS would be implemented. This chapter presents conclusions and recommendations for this study.

6.1 Summary of Findings

This study was about the development of an implementation and use framework for organisations. The Ministry of Health was chosen as the case study. The choice of MOH as a case study was based on the fact that it is one of the many government agencies, which has had limited use of the implemented Information Systems. At the Ministry of Health, we investigated the implementation and use of iHRIS. In our investigation, we focused on understanding how iHRIS was implemented and how it is currently being used. The primary data collection methodology for this study was the questionnaire. It was selected on the basis that it presented the best opportunity to understand the nature of IS implementation and use in the organisation by placing the least number of restrictions upon the information collected. One-on-one interviews were conducted as a follow up on the questionnaire. Focus group discussions were used because they enabled the researcher to get data in the respondents' own words on how they felt about the new system. The summary of findings are discussed below.

This study found that there are a series of challenges that affect IS projects. The IS challenges can be related to having a new system that does not meet the organisational requirements, poor planning in terms of needed resources, scope or time requirements, inadequate training or failing to identify the right stakeholders. The study also found out that IS challenges can also be related to not understanding the organisational climate in terms of politics, power relations and beliefs as was seen in the implementation of iHRIS at the Ministry of Health. Ignoring of the aspects that are linked to organisation culture can increase the likelihood of failure. The other challenges were related to there being no clear definition of organisational processes and tasks during requirements gathering. Many employees at the MoH had inadequate understanding of organisational processes and as a result, requirements definition became a problem. At the same time, the implementation team had little understanding of organisational tasks and processes including their linkages.

The other findings were limited stakeholder involvement during system implementation, which contributed to inadequate system requirements gathering and hence created a negative attitude towards the entire project. Also the adoption and adaptation stages took look and the key stakeholders gradually lost interest in the system. Some employees had inadequate computer skills, which affected the use of the system. The study also found out that the Ministry of Health lacked of a clear implementation methodology. Disunity and power relations within the user departments further escalated lack of a clear implementation methodology. Lastly the presence of similar systems within the Ministry of Health was discovered as another factor that affected the utilization of iHRIS.

6.2 Conclusion

Having analyzed the challenges that the Ministry of Health faced in the implementation and utilization of iHRIS, one conclusion was arrived at. There was need to develop a comprehensive framework that integrates aspects of implementation and use. The implementation framework should combine both implementation and use factors that were identified by the study to fall under organisational level, project level, IS level and User level. The framework that was developed in this study is broken down into seven stages including Initiation, adoption, adaptation, acceptance, routinization, infusion and optimization. Various aspects were identified

at the different stages of project and post-project phases. It is however important to note, that the framework that was developed by this study is an extension of Statnikova (2005)'s IT implementation model. Although this model did mention of the post-project phases of routinization and infusion, its focus was mainly on the project phases of initiation, adoption, adaptation and acceptance. The framework that has been developed by this study has not only improved on the aspects highlighted by Statnikova (2005), but has also added a new stage in the post project phase referred to as optimization. It is our belief that if organisations embrace optimization as one of the post project stages, they are likely to extract maximum benefits from the implemented systems.

6.3 Recommendations for Further Research:

The findings of this study and limitation have resulted in the identification of potential areas for future research directions. The recommendations for further research are indicated below.

More research needs to be conducted to validate the findings that are presented here in order to increase the generalization of results in different contextual environments. Re-testing the research findings and recommendations in different organisations will help determine whether the impact is the same.

The framework needs to be validated in a live environment and within multiple organisational contexts. Also there could be further investigations that can extend the framework as new factors emerge.

Despite that research has been conducted in the area of IS implementation, the area of IS use is still in a young phase. Thus more research still needs to be carried out in this area with emphasis on Uganda and other developing countries. Further studies need to expand knowledge on IS implementation and use beyond this study.

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APPENDIX I: INTRODUCTORY LETTER

Telephone: General Lines: 256-417-712260
Permanent Secretary's Office: 256 – 417 – 712221
Fax: 256 – 417 – 231584
340887

E-mail: ps@health.go.ug
Website: www.health.go.ug

The REPUBLIC OF UGANDA

Ministry of Health
P. O. Box 7272
Kampala
Uganda

IN ANY CORRESPONDENCE ON: ADM., 30|313|05

1st June 2016

Heads of Department

Ministry of Health

RE: MS. LOGOSE JULIANA JASMINE

This serves to introduce to you *Ms. Logose Juliana Jasmine,* a student pursuing studies leading to the award of Masters of Science in ICT Management, Policy and Architectural design at the Uganda Martyrs University.

She is undertaking a research under the topic "Framework for Information System implementation and use in organisations' a case study of the Ministry of Health, Uganda."

This letter therefore serves to request you to accord her the necessary assistance in carrying out this research.

Thank you for your cooperation

Yours Sincerely,

David Katabarwa

For: Permanent Secretary

APPENDIX II: DATA ANALYSIS FRAMEWOK

Colaizzi's (1978) Framework for Qualitative Data Analysis

1. Read all protocols to acquire a feeling for them.

2. Review each protocol and extract significant statements.

3. Spell out the meaning of each significant statement i.e. formulate meanings.

4. Organize the formulated meanings into cluster of themes. Refer these clusters back to the original protocols to validate them. Note discrepancies among or between the various clusters, avoiding the temptation of ignoring data or themes that do not fit.

5. Integrate results into an exhaustive description of the phenomenon under study.

6. Formulate an exhaustive description of the phenomenon under study in as unequivocal a statement of identification as possible.

7. Ask participants about the findings thus far as a final validating step.

APPENDIX III - PARTICIPANTS INVITATION LETTER

UGANDA MARTYRS UNIVERSITY (UMU)

PARTICIPANTS INVITATION LETTER

Dear (participant's name)

This letter is an invitation to consider participating in a study I am conducting as part of my Master's degree in ICT Management, Policy and architectural design at Uganda martyrs University. Particularly, I am exploring the way the integrated Human Resource Information System (iHRIS) was implemented at the Ministry of Health and how it is currently being used. I believe that because you were actively involved in the iHRIS implementation project and its current use in your department, you are best suited to respond to the various issues, such as what influenced you decision to use this system, how easy it was to learn how to use it, what type of support you were provided during iHRIS implementation process, how well this new system fit with your work style etc. The purpose of this study, therefore, is to develop a framework for successful the implementation and use of information systems such as iHRIS in organisations. Participation in this study is voluntary and all data collected will be confidential. It will involve a completion of a questionnaire. Interview will be conducted after the questionnaire is completed. In addition, focus group discussions will be conducted among the various facets of group users. All information you provide is to be considered completely

Thank you in advance for your assistance

Sincerely,

Logose Juliana Jasmine

UGANDA MARTYRS UNIVERSITY (UMU)

QUESTIONNAIRE FOR MoH STAFF

Dear Sir/Madam,

My name is **Jasmine Logose**, a Postgraduate student of Uganda Martyrs University, Nkozi. I am carrying out a study that is aimed at developing a **Framework for Effective Implementation and Use of Information Systems in Organisations: A Case Study of the Ministry of Health-Uganda.** . This study is part of the requirements for the award of a Master of Science Degree in ICT Management, Policy and Architectural Design

I am inviting you to participate in this study by completing the questionnaire below. If you choose to participate in this study, please answer all questions as honestly as possible. Participation is strictly voluntary and you may refuse to participate at any time. The data collected will provide useful information regarding the development of a framework for effective implementation and use of information systems in organisation. If you would like a copy of this study please let me know as I come to pick the completed questionnaire. Completion and return of the questionnaire will indicate your willingness to participate in this study. If you require additional information or have questions, please contact me on 0703565332.

Thank you for taking the time to participate in this study.

Yours Sincerely

…………………………..

Jasmine Logose

Section A: Biographic Data

Name………………………………………………………. (Optional)

Position……………………………………………………

Telephone contact…………………………………………

Department………………………………………………………

Section B: Implementation

1. What is your understanding of the term information system?

2. Were you notified of the purpose of HRIS?

(a) Yes   (b) No (Skip to Qn. 4)

3. If yes, how were you notified?

4. If no, why in your opinion were you notified?

5. Were you satisfied with the manner in which the implementation of HRIS was carried out? (a) Yes   (b) No (Skip to Qn.7)

6. If yes, what contributed to your satisfaction with the way the implementation of the HRIS was carried out?

7. If no, what aspects of the implementation process made you unsatisfied?

8. Were you satisfied with the support of the HRIS implementation team during the implementation process?

(a) Yes   (b) No (Skip to Qn.10)

9.If yes, how would you describe the HRIS implementation teams skills, knowledge, and assistance they provided during implementation process?

10. If no, why were you not satisfied with the services and help provided by the HRIS implementation team during the implementation process?

12. Did the HRIS implementation team have a good understanding of your work routines?

(a) Yes   (b) No (Skip to Qn.14)

13. If yes, how important was it that the implementation team had a good understanding about your work routines?

14. If no, how different would the implementation of the HRIS have been different if the implementing team had a better understanding of your work routines?

Commitment to Change

15. In your opinion, do you think that changes in work routines and procedures should have been an important consideration in assessing your use of the HRIS?

(a) Yes (b) No (Skip to Qn.17)

16. If yes, how important was it for you that the new system would change your work routines?

17. If no, why do you think that changes in your work routines were not an important consideration for you in deciding whether or not to use HRIS?

Task Technology Fit, Complexity and Training

18. Does the HRIS fit well with the way you want to work?

(a) Yes   (b) No (Skip to Qn.20)

19. If yes,

(i) What makes the HRIS fit well with your work routines and the way you like to work?

(ii) How would you describe time and effort required to alter your tasks to align with the processes built into the HRIS?

20. If no, what aspects of your work routines are not compatible with the HRIS?

21. In your opinion, is the HRIS system easy to learn?

(a) Yes   (b) No (Skip Qn.23)

22. If yes, what made the HRIS system easy to learn?

23. If no,

(i) What made the HRIS system hard to learn?

(ii) In your opinion what should have been done to make the HRIS easy to learn?

System Acceptance

24. Does the HRIS help you improve on your performance at your work place?

(a) Yes   (b) No (Skip to Qn. 26)

25. If yes, how has this system improved your performance?

26. If no, why do you think that HRIS has not helped you to improve on your performance?

27. Does the HRIS require you to perform additional tasks in the course of doing your work?

(a)Yes   (b) No (Skip to Qn. 29)

28. If yes, how do these additional tasks make you feel about your work routines?

29. Has your satisfaction with your job increased as a result of HRIS?

(a) Yes   (b) No (Skip to Qn. 31)

30. If yes, how has the introduction of the HRIS influenced your increase in job satisfaction?

31. If no, how has the introduction of the HRIS influenced your decrease in job satisfaction?

32. Has the introduction of the HRIS made your work less stressful and enjoyable?

(a) Yes   (b) No (Skip to Qn.34)

33. If yes,

(i) In what ways has your <u>work environment</u> changed since the introduction of the HRIS?

 (ii) What changes associated with the HRIS use have been beneficial to your work?

34. If no, what changes make your work more stressful?

35. How has the introduction of the HRIS affected your relationship/communication with other staff who use the system at the MoH?

Management Commitment and Support

36. Did management encourage and support you to use the system?

(a) Yes   (b) No (skip to Qn. 38)

37. If yes,

(i) How did management support and encourage you to use HRIS?

 (ii) Do you think that management support and encouragement was important for your interest in using the system?

38.If no,

(i) Why do you think management did not support and encourage you to use the HRIS?

(ii) Would your decision about system use be different <u>if management</u> had supported and encouraged you to use the HRIS?

39. In your opinion, was management effective in forwarding users' problems to the HRIS implementation team?

(a) Yes   (b) No (Skip to Qn. 41)

40. If yes, how do you think the management's ability to communicate effectively with the implementation team contributed to the HRIS implementation process?

41. If no, why do you think management was not effective in forwarding users' problems to the HRIS implementation team?

Users Attitude towards HRIS System

42. Were you satisfied with the old way of working before the implementation HRIS?

(a) Yes   (b) No (Skip to Qn.44)

43. If yes, why?

(i) <u>How well</u> was that method of work support the business processes at MoH?

 (ii) What was the old method of work's impact on your job effectiveness and productivity?

44. If no, why have you decided to use the new system if you were satisfied with the old one?

45. How would you describe the MoH ICT infrastructure and its impact on your effectiveness and productivity in your job?

46. Are computers and their services a valuable aid to you in the performance of your duties at the MoH?

(a) Yes   (b) No (Skip to Qn. 48)

47. If yes, why do you find computers and their services a valuable aid to you in the performance of your job?

48. If no, why do you think computers and their services are not a valuable aid to you in the performance at your job?

49. How would you describe your understanding of computers now and your experience before HRIS?

50. Do you feel that HRIS implementation results depended on the level of technical expertise present at the MoH?

(a) Yes   (b) No (Skip to Qn. 52)

51.If yes, what aspects of the HRIS are more advantageous to you in performance at the job in comparison to the old way of working?

52. If no, what makes the HRIS less advantageous to you in comparison to old way of working?

53. Does the HRIS help you to accomplish your tasks quickly?

(a) Yes   (b) No (Skip to Qn. 54)

54. If yes, in what ways does the system enable you to accomplish tasks more quickly?

55. If no, why does the system not help you to accomplish tasks more quickly?

56. Does the HRIS system enhance your effectiveness at work?

(a) Yes   (b) No (Skip to Qn. 57)

57. If yes, how does the system enhance your effectiveness at work?

58. If no, why is the system not enhancing your effectiveness at work?

User satisfaction

59. Before using HRIS, did you have a chance to experiment it on a trial basis?

(a) Yes   (b) No (Skip to Qn.61)

60. If yes,

(i) How important it was for you to try out the new system first?

 (ii) Did it help you to make a decision about whether or not you would continue using it?

61. If no, how do you think your use of the new system would be different if you had an opportunity to experiment with it on a trial basis before committing to its use?

62. Were you interested and excited about the HRIS?

(a) Yes   (b) No (Skip to Qn.64)

63. If yes, did you feel that HRIS was both important and personally relevant to you?

64. If no, why were you not exited and interested in the HRIS implementation effort?

65. Do you have a high level of control and confidence while working with the HRIS?

(a) Yes   (b) No (Skip to Qn.67)

66. If yes, to what do you attribute the high level of confidence and control you have while working with the HRIS?

67. What makes you lack the feeling of confidence and control while working with HRIS?

68. Is the access to the HRIS easy and convenient?

(a) Yes   (b) No (Skip to Qn.70)

69. If yes, what makes the system easy and convenient to access?

70. If no, what makes the system hard and not convenient to access?

71. Does the HRIS have any errors that you have to work around?

(a) Yes   (b) No (Skip to Qn. 73)

72. If yes,

(i) How has that affected your work effectiveness?

 (ii) Was it hard to figure out how to work around the system errors?

73. Does the HRIS have the ability to integrate data with other information systems that you use at the MoH?

(a) Yes   (b) No (Skip to Qn.75)

74. If yes, how convenient and easy is it to integrate data from HRIS with other systems that you use?

75. If no, how important it is for you that the system would have the ability to integrate it data with other systems you use?

76. Is the HRIS flexible to changes and adjustments that result from new conditions, demands, or circumstances at your workplace?

(a) Yes   (b) No (Skip to Qn.78)

77. If yes, what makes the system easy to do what you want?

78. If no, what makes HRIS difficult to adjust to the changes in the way you work and the new conditions at work?

APPENDIX IV: QUESTIONNAIRE FOR MOH IMPLEMENTATION TEAM

UGANDA MARTYRS UNIVERSITY (UMU)

QUESTIONNAIRE FOR MOH IMPLEMENTATION TEAM

Dear Sir/Madam,

My name is **Jasmine Juliana Logose**, a Postgraduate student of Uganda Martyrs University, Nkozi. I am carrying out a study that is aimed at developing a **Framework for Effective Implementation and Use of Information Systems in Organisations: A Case Study of the Ministry of Health-Uganda.** This study is part of the requirements for the award of a Master of Science Degree in ICT Management, Policy and Architectural Design

I am inviting you to participate in this study by completing the questionnaire below. If you choose to participate in this study, please answer all questions as honestly as possible. Participation is strictly voluntary and you may refuse to participate at any time. The data collected will provide useful information regarding the development of a framework for effective implementation and use of information systems in organisation. If you would like a copy of this study please let me know as I come to pick the completed questionnaire. Completion and return of the questionnaire will indicate your willingness to participate in this study. If you require additional information or have questions, please contact me on 0703565332.

Thank you for taking the time to participate in this study.

Yours Sincerely

…………………………..

Jasmine Juliana Logose

Section A: Biographic Data

Name…………………………………………………………… (Optional)

Position……………………………………………………

Telephone contact………………………………………………

Department……………………………………………………………

Section B:

Human Resource Information System (HRIS) Implementation

1. What is your understanding of the term information system?

2. Did you participate in the implementation the HRIS that was recently implemented by the MOH?

(a) Yes   (b) No (Skip to Qn.4)

3. If yes, what role did you play?

4. Before the commencement of the HRIS project, were you familiar with the objectives and implementation process?

(a) Yes   (b) No (Skip to Qn. 6)

5. If yes,

(i) How did you learn about the objectives, implementation plan, schedules and the steps you would go through?

(ii) Who provided you with this information?

6. If no.

(i) Were you satisfied with the level of information you were given about proposed HRIS project

(ii) Do you think that if you had been given more information about implementation process the results of your new system use would be different?

7. Did the HRIS implementation team have a good understanding of your work routines?

(a) Yes   (b) No (Skip to Qn.9)

8. If yes, how important it was that the implementation team had a good understanding about your work routines?

9. If no, how different would the implementation of the HRIS have been different if the implementing team had a better understanding of your work routines?

10. At the commencement of the implementation process, were you given a clear plan to guide you during the implementation process?

(a)Yes   (b) No (Skip to 12)

11. If yes, how helpful was the implementation plan?

12. If no, how different would the implementation of the HRIS have been if you had an implementation plan?

13. Were you regularly updated by the HRIS implementation team of the progress and challenges faced during the implementation process?

(a)Yes   (b) No (skip to Qn.15)

14. If yes,

(i) How would you describe the manner and methods of interaction between you and the HRIS implementation team regarding the progress, changes, and problems during the implementation process?

 (i) How helpful was it for you?

15. If no, why do you think HRIS implementation team did not do a good job in keeping you informed about the status of implementation project?

16. In your opinion was the implementation process of the HRIS stressful?

(a) Yes   (b) No (Skip to Qn. 18)

17. If yes, what in your opinion made the implementation process stressful?

18. If no, what made the implementation process smooth?

19. Were you satisfied with the manner in which the implementation of HRIS was carried out?

(a) Yes   (b) No (Skip to Qn.21)

20. If yes, what contributed to your satisfaction with the way the implementation of the HRIS was carried out?

21. If no, what aspects of the implementation process made you unsatisfied?

22. Before the HRIS was implemented, were you sure that it would provide a solution to the human resource management related challenges that MOH was facing?

(a) Yes   (b) No (Skip to Qn.24)

23. If yes, what convinced you that the new solution would be able to address those challenges?

24. If no, why were you hesitant that the new solution would not be able to address those challenges?

Commitment to Change

25. Were you willing to change the way you do work at the MOH in order to enable the new HRIS to work?

(a) Yes (b)   No (Skip to Qn. 27)

26. If yes, how difficult was it for you to make adjustments to the way you work in order to allow the HRIS to be effectively used?

27. If no, why were you not committed to making the necessary changes to the way you do work in order to allow the new HRIS to be used effectively?

28. If at the beginning of HRIS project you had realized the resources (time, people) required to see this project through, would you have participated?

(a) Yes   (b) No (Skip to Qn.30)

29. If yes why would you participate?

30. If no, why would you not participate?

31. In your opinion, was the implementation team for the HRIS competent enough to handle all the implementation challenges?

(a) Yes   (b) No (Skip to Qn.33)

32. How effective was it in handling problems during implementation?

33. If no, why do you think that the team was not able to handle all the problems during the implementation process?

Management Commitment and Support

34. At the inception of the HRIS project, was the management at MoH aware of the changes that would result from the implementation and use of the new system?

(a) Yes   (b) No (Skip to Qn.36)

35. If yes, why do you think management did not foresee the complexity of changes that would result as a consequence of the HRIS implementation?

36. If no, why do think management did to analyze and prepare for changes that would result as a consequence of the new system implementation?

37. Did the management at MoH take an active role in the preparation of an implementation plan for HRIS?

(a) Yes   (b) No (Skip to Qn.39)

38. If yes,

(i) Were all the key stakeholders to HRIS project consulted during the preparation of the implementation plan?

(ii) Were the key stakeholders to the HRIS project able to make changes to the implementation plan?

39. If no,

(i) Why do you think management did not take an active role in the preparation of the implementation plan of the HRIS?

(ii) If management had taken part in the preparation of the implementation plan, do you think that the results would have been different? **Justify**

40. Was management aware of the benefits that could be achieved as a result of the successful implementation of the HRIS system?

(a) Yes   (b) No (Skip to Qn. 42)

41. If yes, how well do you think management was familiar with what the new system could do for the ministry?

42. If no,

(i) In your opinion how important was it for management to be aware of what benefits the HRIS could bring to the Ministry?

(i) Do you think that the results of the implementation would be different if management knew well how the HRIS could contribute to the Ministry?

43. Was the management enthusiastic about the implementation of the HRIS?

(a) Yes   (b) No (Skip to 45)

44. If yes,

(i) How would you describe the level of management involvement during the implementation process?

(ii) Do you feel that management had a good understanding/knowledge about the implementation process?

(iii) Did management agree with the implementation team on how to implement the system?

45. If no,

(i) In your opinion, why was management not enthusiastic about the implementation of the HRIS?

(ii) Do you think that the results of the HRIS implementation and use would be different if management had put more interest in it?

46. From the HRIS project, did management view the HRIS as being important to achieving the long-term goals and objectives of the Ministry?

(a) Yes   (b) No (Skip to Qn. 48)

47. If yes,

(i) Why do you think management viewed the HRIS as being important to the ministry's long-term goals and objectives?

(ii) Do you think that the management belief about the HRIS importance to the ministry contributed to your decision to use the system?

48. If no,

(i) Why do you think management did not view the HRIS as being important to the ministry's long-term goals and objectives?

(ii) In your opinion, do you think that management position regarding the HRIS had an influence on the users' decision about using the system in any way?

49. In your opinion, do you think that management provided the necessary support and resources to enable the use of the HRIS?

(a) Yes   (b) No (Skip to Qn. 51)

50. If yes, how important was this for the HRIS success?

51. If no,

(i) How different would the results in implementation be if enough resources (money, people, infrastructure etc.) had been secured?

(ii) Why did the project lack enough resources?

52. Did management encourage users to use the HRIS?

(a) Yes   (b) No (Skip to Qn. 54)

53. If yes,

(i) How did management support and encourage you to use HRIS system and to participate in the implementation effort?

(ii) Do you think that was important for the success of the project?

54. If no, why do you think management did not support and encourage users to use the HRIS and to participate in the implementation effort?

55. Was management effective in addressing problems to the HRIS implementation team?

(a) Yes   (b) No (Skip to Qn. 57)

56. If yes, how do you think management's ability to communicate effectively with the implementation team contributed to the HRIS system implementation process?

57. If no, why do you think management was not effective in addressing problems to the HRIS implementation team?

58. Was management very effective in supporting changes in existing routines and processes that were critical to the HRIS implementation?

(a) Yes   (b) No (Skip to Qn. 60)

59. If yes,

(i) How did management support new changes in existing routines and processes?

 (ii) How did this contribute to HRIS acceptance?

60. If no, how do you think the results of HRIS use and implementation would be different if management was more effective in supporting and promoting changes in existing routines and processes that were critical to the new system implementation?

61. Did the implementation team of the HRIS encounter any problems during the implementation process?

(a) Yes   (b) No (Skip to Qn. 63)

62. If yes, how effective was management in handling problems during implementation of the HRIS system?

63. If no, why do you think management was not able to handle problems during implementation process?

Thank you for taking your time to respond to this Questionnaire