A FRAMEWORK FOR PROMITING ICT USAGE IN PARASTATALS IN UGANDA.

Case Study: Uganda Electricity Transmission Company Limited

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UGANDA MARTYRS UNIVERSITY, NKOZI

November, 2016

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A Postgraduate dissertation submitted to the faculty of science in partial fulfilment of the requirements for the award of Master of Science in ICT Management, Policy and Architectural Design

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DEDICATION

I dedicate this work to my family and friends for all the encouragements and motivations during this course and most importantly to God for all being there with me throughout all the challenges that were encountered during the course if this study.

ACKNOWLEDGEMENT

I thank God for the gift of life and courage towards finishing this course as it was part of my life achievements in the field of academia. God has granted me good health throughout this course and He has endured me the courage to overcome all the challenges in my struggle to complete this course and dissertation.

In a special way I would like to express my profound endless appreciation to my dissertation supervisor Mr. Angole Richard Okello for his dedication, knowledge sharing, encouragement and guidance towards completing this dissertation. I strongly thank him for his efforts, time and dedication as my supervisor.

I wish to thank Uganda Martyrs University Nkozi Administration and teaching staff for the excellent knowledge sharing for the course of this post-graduate and I surely shall carry on the knowledge I got from them while referring to them wherever I go.

I also would like to extend my gratitude to all 2014 MSc. ICT post graduate students in my class for the time that we had together during this course, the bonds developed through academia have indeed grown to surpass the academic realm into stronger bonds . I wish we continue like this wherever we go so that the spirit of teamwork remains in us.

I also thank all my family for the encouragement, motivation and support given during the pursuit of this course.

I would like also to thank the Management and staff at Uganda Electricity Transmission Company Limited and Kampala Capital City Authority for granting me this opportunity to use the organization as a case study during my course and the staff for taking off time to participate in the survey.

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ACRONYMS

CEO	Chief Executive Officer
DOI	Diffusion of Innovations
DRL	Dynamic Resource Link
EDI	Electronic Data Interchange
GIS	Geographical Information Systems
ICT	Information and Communication Technology
ISO	Interorganizational
KCCA	Kampala Capital City Authority
NSSF	National Social Security Fund
PSSE	Power System Simulator for Engineering
TAM	Technology Acceptance Model
TOE	Technology Organization Environment
TRA	Theory of Reasoned Action
SME	Small and Medium Enterprises
UETCL	Uganda Electricity Transmission Company Limited
UNESCO	United Nations Education Scientific and Cultural Organization
URA	Uganda Revenue Authority
UTAUT	Unified Theory of Accepted and User Technology
WIS	Wayleaves Information System

ABSTRACT.

This study was about the development of a framework for Information and Communication Technology (ICT) usage in the parastatals in Uganda. It involved reviewing literature on the challenges that parastatals facing in using of information and communication technologies. It also involved a review of the different ICT usage approaches that are currently in use. Questionnaires, interviews and focus group discussions and observations were used to collect data. To analyse the collected data Colaizzi's (1978) framework for data analysis was used during the study. The public utility sector was considered as a case study with a focus on Uganda Electricity Transmission Company Limited (UETCL). The analysis results indicated that UETCL faces a number of challenges in utilization of ICTs. These challenges include; a lack of management and organization support to ensure that ICT is utilized, uncoordinated and unplanned ICT adoption, a lack of the full implementation of the ICT policy document, lack of awareness of the diffusion processes of ICT into organizational culture, lack of a holistic ICT selection, design and implementation plan, a lack of a structured needs assessment.

The main objectives of this research were to review the existing frameworks for ICT usage and thus extend one of the most appropriate existing frameworks to build a proposed framework for ICT usage among parastatals in Uganda which would eventually lead to formulation of a proposed framework promoting ICT usage.

Based on the findings of this study, an adoption and utilization framework was developed. The developed framework is an extension of Technology Organization Environment *(Tornatzky and Fleischer: 1990*) framework.

The different stages of TOE framework were improved using constructs adopted from other adoption and utilization approaches including, Diffusion of Innovations theory, Technology Acceptance Model, Theory of Perceived Benefits of the ICT and other theoretical and conceptual studies carried out.

The developed framework is expected to help parastatals realize improved efficiency in public service delivery provision. Thus more research still needs to be carried out in these areas with emphasis on Uganda and other developing countries.

The findings of the study pointed to various new approaches of ICT adoption and utilization through consideration of the three factors of the technology, the organization and the environment within which the parastatal operates in.

This framework was found to be appropriate and useful in its applicability within the parastatals in Uganda for adoption and utilization of ICT in their business processes aiming at improving the service delivery

As a recommendation, this research study can be further validated by more experts in enterprise architecture to make it even more refined to parastatals and expounded on it to build a framework for that can be further extended to cater for the very infant stage of ICT implementation in Uganda.

CHAPTER ONE: INTRODUCTION

1.0. Introduction

In this digital information age, adoption and use of Information Communication Technology (ICT) is a strategy that many parastatals have adopted with the aim of increasing productivity and staying competitive. Globally, several organisations and businesses are investing massively in Information Communication and Technology in many various aspects at various stages of their businesses process because of the great opportunity of improving effectiveness and efficiency in their businesses and their associated costs.

In the context of this report, usage, use, utilization and adoption cover both the adoption of ICT and the use of the ICTs' in these parastatals and are used interchangeably.

World over, there has been a paradigm shift where governments have realized the importance of electronic government (hence e-government) as a strong tool for public-sector service provision excellence understanding and appreciating the contribution of e-government to the government agenda in contrast to the traditional paper-and-file approaches.

According to V. Ndou (2004), ICT E-government applications allow people, businesses, and government sectors to access to available government information 24 hours a day, 7 days a week, which improves the quality of these services.

Information and communication technologies (ICTs) can help to sustain this process in three ways: (i) they can support tasks that involve complex decision making, communication and decision implementation, (ii) they can automate tedious tasks done by humans, and (iii) they can support new tasks and processes that did not exist before. When ICTs are properly aligned with governance goals, they can help to create gains in both efficiency and effectiveness. Bhavya Lal (1999)

In Uganda, many parastatals benefit from utilizing ICT in various ways for example from the National ICT Policy, ICT has supported internal cooperation initiatives in the field of e-government in order to enhance transparency, accountability and efficiency at levels of government. Also the fact that the various parastatals can benefit from adoption and utilization of ICTs in their respective sectors ICT such as in education, in environment, agriculture, health, in e-commerce initiatives among others.

This study presents a framework that can be used to successfully drive up the use of Information Communication Technology in parastatals to achieve improved service delivery of public goods and services to the public. This framework combines both adoption and use factors that contribute towards ICT utilization success in the parastatals.

In order to contextualize this study, the challenges of ICT adoption and utilization in parastatals; the Uganda Electricity Transmission Company Limited (UETCL) was identified as a case study. The choice of UETCL as a case study was based on the fact that it is one of the many government agencies, set up to provide public services in the electricity sector.

1.1. Background of the Study:

In many parastatals in Uganda, Information and Communication Technologies (ICTs) have been embraced to improve on their operational efficiency and effectiveness in public service delivery. Given a back seat as given their nature of operation, as they are in place mainly to avail a public service or good and not to generate profit and ensure business competitiveness, it is at times hard to justify the sometimes high expenditure into ICT initiatives. This in a way makes it even harder to appreciate the effort to drive the adoption and utilization of ICTs in these utilities.

Currently in Ugandan parastatals, ICT adoption and utilization is a still considered to be low despite the various initiatives to adopt and utilize ICTs to improve their effectiveness and efficiency in public service delivery to the Ugandan public. Ssewanyana, J. and Busler, M. (2007) note that ICT provides increased savings, increased efficiency, improved service delivery, low transaction costs, and improved market performance to the organization that invests in ICTs.

Parastatals in Uganda have at varying levels been able to adopt Information and Communication Technology (ICT) resources into their business operations and many of these have been success stories from their adoption of these resources.

These include; Uganda Revenue Authority (URA) with its e-tax platform, which have dedicated full resources and with management support have embraced ICT to a level that has seen them attain visible results in productivity, business-like efficiency and competitiveness among regional and global utilities.

However, it should be noted that besides profit generation and business competitiveness, these utilities in their mandate to provide\extend public services and goods, have to ensure that they do so efficiently and effectively and in the case of Uganda National Roads Authority (UNRA) with the UNRA Act, 2006: have to operate in a business-like manner.

In the case study, one of the missions of on which Uganda Electricity Transmission Company Limited (UETCL) runs on is “to be a commercially focused single buyer actor”

This in effect emphasizes the need for these utilities to adopt and utilize effectively ICT in their mandate and objectives.

However, one of the main reasons why ICT usage in many organizations faces a big challenge is the lack of an evaluation framework to measure the use effects of ICT adoption and utilization to the parastatals.

Adoption of ICT into the operations of UETCL is projected as an improvement in business competitiveness, productivity and business efficiency of the utility. This is clearly evidenced with the utilities such as Uganda Revenue Authority, which have dedicated full resources and with management support have embraced ICT to a level that has seen them attain visible results in productivity, business-like efficiency and competitiveness among regional and global utilities.

1.2. Problem Statement

Diffusion of ICT through organisations needs to be effectively managed to better prepare for future ICT application adoption (Markus, 1987). The forces that have driven organizations to adopt and incorporate ICT in business operations include greater information access; greater communication, increased efficiency, increased cooperation and collaboration, cost-effectiveness and pedagogical improvement (Surry and Ely, 2001)

In Ugandan parastatals today, the organizational efficiency and effectiveness has been noted to still be slow and in many cases still bureaucratic and inefficient and ineffective in their organizational performance. To curtail this, most of these organizations have had ICT adoption drives in their organizational\business processes. However, there hasn’t been adequate attention given to ensure that the adopted ICT resources are effectively utilized within these enterprises in order to have that impact on improved public service delivery. This study therefore looks to develop a framework for effective utilization of ICTs in organizations particularly in parastatals in Uganda.

1.3. Objectives of the Study

1.3.1. Main objective

The major objective of this study was to develop a framework for the promotion ICT usage in parastatals.

1.3.2. Specific Objective of the Study

i) To examine existing frameworks, models and concepts on ICT usage

ii) Propose a framework promoting ICT usage in parastatals.

iii) Validate the proposed ICT usage promotion framework

1.4. Significance of the Study

ICT adoption and usage in parastatals come at a high expense to the tax payer and mainly so that these parastatals can operate more efficiently and effectively in their role in public service delivery. Organisations are spending over 50% of their budgets on ICTs that are delivering only 10% of the desired benefits (McAfee, 2006 cited in Burton-Jones & Grange, 2011). This emphasizes the fact that the expenditure in adopting these ICTs is high compared to the value the ICT is returning

This value addition of ICT not being realized despite of the valiant efforts put up by some of those parastatals that have adopted and use ICTs has led to the review of the critical aspect of ICT utilization in parastatals to be able to derive the desired effectiveness and efficiency of adopted Information and Communication Technologies within these organizations and its impact on the improved performance in public service delivery to the public.

This study is one of the academic researches that examines the use factors of Information and Communication Technology in parastatals in Uganda as a case study, extending the body of knowledge in this research area.

1.5. Research Scope

1.5.1. Geographical scope

The study was carried out at Uganda Electricity Transmission Company Limited at the main headquarters in the Central Business District of Kampala. It mainly focused on the organizational units that use ICT in their everyday business operations. These included: ICT department, Planning and Investments department, Projects Implementation department, Human Resources and Administration and Finance Accounts and Sales department. These units were considered in this study because they are heavy users of the ICT systems and are directly involved in the planning and adoption of ICT systems in the company.

1.5.2. Time scope

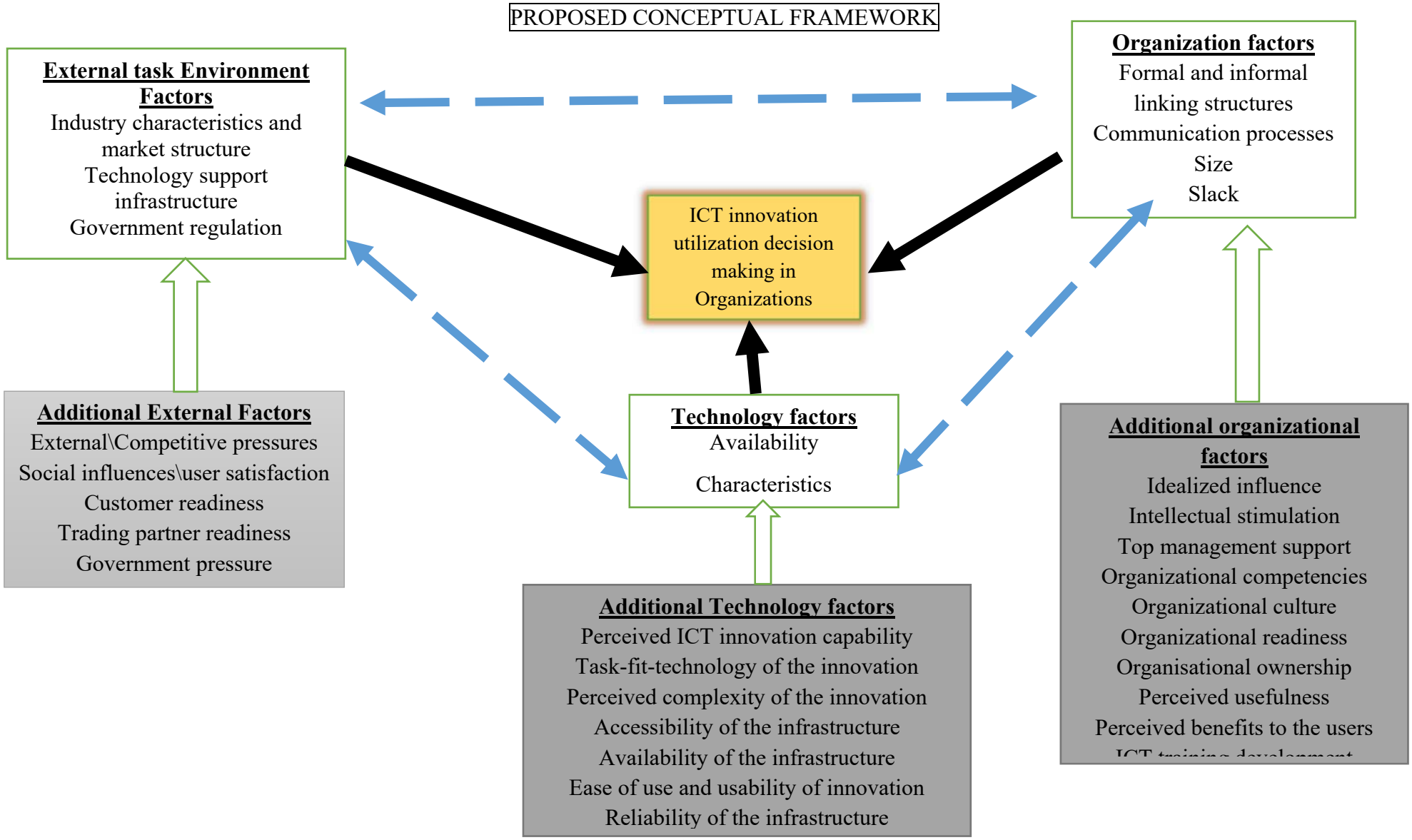
This study was conducted in the time phase of April – September 2016.

1.5.3. Content Scope

The study examined the challenges faced by UETCL in utilizing the various adopted Information and Communication Technologies across the organizational units already described with a view of identifying the gaps associated with the using the technologies that are in place many focusing on the opinions of the members of those departments.

The study looked also into how the use of these ICTs' can be used to enable the organization achieve organizational efficiency and a much higher productivity.

1.6. **Conceptual Framework**



1.7. Conclusion

This chapter introduced the research report, giving an overview of Information and Communication Technology use constraints in parastatals, detailing the background to the study, scope and outlines the reasons why it is important to understand the ICT challenges in parastatals. The significance of the research has also been presented.

The preceding chapter reviews the literature related to the research problem identified.

CHAPTER TWO: LITERATURE REVIEW

2.1. Introduction

This chapter explored in depth the concept of ICT effective utilization in parastatals through a review of the various theories as well as empirical studies.

This covered the ideas and concepts, theoretical aspects, empirical evidence on some of the factors affecting the effective utilization of ICT technologies and the different frameworks that can be used to effectively utilize these ICTs within organizations.

2.2. Concept ICT Utilization in organizations.

Information and Communication Technology (ICT) are widely used in organizations. Their use has many favourable consequences, because they support interaction and collaboration, workplace learning (Andriessen, 2003), and work performance (Ciborra and Patriotta, 1996; Jones and Kochtanek, 2004; Nunamaker, 1997; Orlikowski, 1996).

Several studies demonstrate that ICT investments are beneficial for performance and productivity (Bharadwaj et al., 1999; Hitt and Brynjolfsson, 1996).

However, the implementation of ICTs always entails both organizational and individual changes (Rogers, 1995; Van de Ven, 1986), and therefore user adoption and establishing the use of ICT systems have proven challenging in organizations (Bullen and Bennet, 1990; Burns et al., 1991; Grudin, 1989; Kwon and Zmud, 1987; Orlikowski,1993).

The challenges and problems associated with the implementation, adoption and utilization of ICT systems have led scholars and practitioners to seek to understand and manage the processes and phenomena related to the adoption and utilization, spawning an extensive literature on the field (Jeyaraj et al., 2006).

In the case study, UETCL, a lot of investment has been poured in ICT technologies, automating business processes, improving workflows of the business processes among others.

However, it remains to be seen how much impact the adoption and utilization of these ICT technologies have had on: the organization (processes and structures), the users (Individuals and organizational culture), the environment (network organizations and the information economy), and the social-economic development of Uganda as a result of this ICT utilization.

According to Bowman et al (2005), the entire process of adoption, implementation, use and effects of ICT at an organizational level involves various levels of analysis, these are:

Adoption phase: investigation, research, consideration and decision making; implementation phase: strategy formation, project definition and countering any resistance there may be against

the ICT application activities in which an adopted application is introduced with the aim of removing reservations, familiarizing the users with the application and training them in such a way that they will use it in a meaningful way; use phase: application of the ICT in their daily operational activities and effects phase: for the consequences of the use of an ICT application f consequences for the individual execution of tasks within the organization, for communication processes and structures within and between organizations, and for the position of the organization within its environment.

Hammer and Mangurian (1987) distinguish three kinds of consequences of ICT utilization for organizations: effects on the efficiency of business processes, effectiveness these processes, in terms of innovation, that is, the generation and implementation of new ideas.
These three kinds of effects can be related to the acceleration of certain processes (time), the expansion of the geographical reach of the organization (distance), and the relationships the organization maintains with its environment.
'**First level** effects of ICTs are the anticipated technical ones – the planned efficiency gains or productivity gains that justify an investment in new technology' (Sproull and Kiesler, 1991).
Second-level effects, relate to the social structure of the organization: for example, changes in the communication structures in and between organizations as a result of the use of ICT. Changes in the social structure of the organization, for example, new or changing communication patterns, new roles within social networks or new patterns of dependency between actors, are examples of second-level effects. The adoption and use of ICT applications (communication media, finally) will have both first- and second-level effects.
ICT adoption and implementation in organizations on its own has many factor that are intertwined into the eventual utilization of these technologies.
Therefore, before going into the utilization of ICT and its effects on an organization, the factors that influence the adoption and implementation have to be examined.

2.3. Benefits of ICT Utilization to organizations.

ICT utilization has been found to be very beneficial to many organizations in many ways including:
Improving efficiency within organizational business processes
Minimizes costs of production for the organization
Empowers staff performance efficiently and effectively.

More pressure to perform efficiently and effectively in the organization especially for parastatals

2.4. ICT adoption and usage framework – A General Overview

2.4.1. Organizations and ICT – An Overview

An organization is a unit of formal positions, usually held by individuals, with explicit objectives, tasks, processes and assets. In other words, an organization is an abstract system of formal positions, tasks and processes.

At a certain point, however, a group becomes so large that we lose sight of the relationships and activities of its members. Whenever the members of a group cease to interact or know each other directly and start defining formal positions, tasks and processes, a transition takes place from a group towards organizations.

One of the main problems facing an organization is how to bring these individual goals and methods in line with the goals and methods of the organization.

The main principle of every organization is its **goals**. The goals can be commercial, social (providing collective services the way [semi-]governments do) or idealistic i.e. political, cultural and religious organizations.

In its strategy the organization decides how to use its various resources in order to achieve its goals. The aim is to work as efficiently, business-like in manner and effectively as possible.

Information and communication technology (ICT) plays an increasingly important role in making organizational goals explicit, in propagating them and, above all, in measuring them and making sure that the organizational goals are translated concrete objectives.

The second important aspect of every organization is its **structure**. This is an abstract of the organization's composition. To reach its goals the organization has a number of tasks that have to be performed by its members using the tools that are available. Individual people are assigned specific tasks within a specific hierarchical structure. Most organizations have a top management level, a staff, a middle management level and a work floor. This division of labour determines the organization's formal structure and the roles that people play, as well as the competencies and responsibilities involved. The execution of tasks is being constantly fed by information and communication channels within the organization (Galbraith, 1973).

In recent decades, ICT has played an increasingly important role in this process. Organizations have come to depend on ICT to such an extent that they cease to function entirely when the computer crashes or the network is 'down'

It is widely believed that the use of ICT, therefore, enables people to shape coordination (Bodendorf & Reinheimer, 1997; Malone & Rockart, 1991; Malone & Crowston, 1994): more effective and more efficient coordination processes, more coordination processes, and new coordination structures.

The third aspect of organizations is and most important to this research is the **organizational culture** in relation to ICT utilization

The general goals and abstract structure of an organization are, realized by the people themselves employed in the organization. These people share a certain set of cultural values, norms and forms of expression that are just as important to the behavior of the members of an organization as its formal goals, structure and tasks. Most of the time, these norms are practices, 'ways-of-doing-things" that these people in these organizations have formed and developed overtime and have had these passed on to all these or in other case rubbed off to new staff.

There is a certain relationship between structure and culture. The level of hierarchy determines what the culture of an organization will look like. The culture found in a flat organization is usually different from that found in a hierarchical one. Compare, for instance, the Public sector in Uganda, with its highly formalized culture, to the informal structure and culture of the private sector, for example a PR\Advertising firm.

The arrival of ICT in an organization can have far- reaching consequences for its culture, but it may also be the culture that determines the adoption and use of ICT. Van den Hooff (1997), for example, discovered that a less formal organizational structure encourages the use of e-mail.

More than ever before, organizations are systems that communicate and process information. Information and communication technology is a technology that is perfectly suited to make organizational processes more effective and efficient.

The way ICT should be introduced in organizations is a process as well: adoption, implementation, use and effect.

Every organization has to adapt to its environment and culture. The environment and culture contains a number of factors that, from the point of view of the organization, are contingent: they are circumstantial in nature.

Organizations focus on a part of the value system or value chain and leave the rest to suppliers and other parties involved in realizing a product or service.

Thus, organizations are increasingly becoming units within a network that have to adapt to a rapidly changing environment.

2.5. Levels of ICT Adoption and Utilization in Parastatals in Uganda

2.5.1. Overview of ICT adoption and utilization in UETCL

As a guiding question for this case, ICT utilization in organizations should be seen to answer the following key questions;

To what degree are ICT applications being used within organizations?

What strategies can an organization use to ensure effective utilization of ICT?

What is the influence of an organizations characteristics on the utilization of ICT by members of the organization?

What do we mean by strategic use of ICT?

Uganda Electricity Transmission Company Limited, founded in 2001 under the auspicious and policy guidance of Ministry of Energy and Mineral Development and Ministry of Finance and Economic Development and mandated to:

To operate the high voltage grid above 33kV and upwards.

Bulk power purchase.

Importer and exporter of power.

Power system operator.

Public infrastructure provider license.

In a bid to improve the business and operational efficiency and as well as staff productivity, UETCL embarked on the development of an ICT strategy which was to effective ensure that ICT resources are adequately utilized. UETCL Management, in adoption to formulation of the ICT policy, Version 1.0 which was approved on 14th June, 2013 to act as a policy guideline document for the utilization of ICT resources.

On top of that, UETCL has put a significant investment in ICT adoption and utilization. This includes the significant investment in ICT infrastructure and systems to run on top of the infrastructure.

The level of the ICT investment is in excess of UGX 1 billion and some of these initiatives include:

Unification of the network infrastructure to carry both voice and data traffic on the same network infrastructure.

Automating most of the company's the business processes to make them have an online presence

Boosting the computing infrastructure with adequate equipment for all the ICT users within the network.

Robust network administration that allows various network applications to run seamlessly

Investment in SAN storage, Firewall protection and Intrusion detection systems and server virtualization of network to allow for redundancy, network protection and availability of storage infrastructure in the network.

Continuously ICT staff training and development of skills to be able to manage and implement the ICT initiatives.

2.5.2. Challenges to utilization of ICT initiatives

Despite of the above efforts and initiatives, there are still challenges that are undermining the value of ICT initiatives and thus further affect the adoption and utilization of these ICTs. Some of these challenges are highlighted below as:

Lack of management support to ensure that many of these ICT initiatives are adopted and fully utilized, uncoordinated and unplanned ICT adoption, poor management and lack of organization support, a lack of the full implementation of the ICT policy document, lack of awareness of the diffusion processes of ICT into organizational culture, budgetary constraints, lack of a holistic ICT selection, design and implementation, an enterprise architectural assessment plan, a lack of a structured needs assessment.

Besides the above much alluded investments and benefits that can accrue to an organization with the right adoption and utilization of ICTs, it remains a much neglected aspect in most parastatals in Uganda. In many cases, the ICT budgets in most parastatals usually suffer the highest budget cuts and also justifying these ICT merits becomes hard for non-technical managers.

2.5.3. ICT Utilization in the Ugandan private sector

In the private sector in the Ugandan economy which is mainly oriented around profit maximization and cost reduction with a big focus on organizational efficiency, and therefore, many of these firms have embraced ICT technologies to maximize their efficiency and profits

and reduce costs. The decision to adopt and utilize these technologies is always a thoroughly thought through process that has to ensure that indeed the technology to be adopted has to be of value to the organization through either improving operational efficiency, profit maximization or cost reduction.

The benefits of ICT use by small and medium enterprises in the private sector (SMEs) were noted to include:

Improving access to and management of relevant information (Tang and Louvieris, 2004), enhancing communications within organizations both internally and externally (Buhalis, 1999), improving operational efficiency through use of specialized and custom made systems and software such as accounting and statistical analysis (Buhalis and Main, 1998), increasing the speed of response to both internal and external customers (Matlay, 2004) and improving customer service (Tang and Louvieris, 2004; Law and Jogararnam, 2005).

More so, with the private sector, the ICT adoption and utilization strategies are usually aligned to the organization's strategic goals and objectives with their own ICT strategic plan fitting into the company's strategic plan with a defined time period.

This adds a stronger case for the ICT adoption, utilization and implementation in with visible impact of ICT being felt in terms of operational efficiency, profit maximization and improved productivity.

2.5.4. ICT Utilization in the Ugandan public sector

However, the impact of ICT in most parastatals is not felt at all despite of the many benefits that ICT adoption and utilization has to offer to any organization. To most parastatals, a slow lethargic attitude towards ICT adoption has been the order of the day as ICT penetration in many public offices and enterprises is still very low. This can be attributed to many factors that include: Organizational culture and Lack of awareness.

It should also be noted that those parastatals that have embraced ICT adoption and utilization through various e-governance initiates, have done so to tremendous success. Key to this is the Uganda Revenue Authority through the *eTax* web portal that has registered numerous payoffs for URA and the GoU. This platform has allowed the many processes and services that were previously handled physically now being done online from anywhere at any time.

National Social Security Fund through it's *e-statements* web portal platform that allows clients to view their saving statements at anytime, anywhere, a feat that was never possible and as

such contributors were never able to find out their savings status. This also appears to be a key factor in the increase in compliance by employers in remitting worker's savings to the fund.

National Water and Sewerage Corporation through it's *e-water* real-time bill payment system which on simplified water bill payments that were previously characterized by contentious figures due to reliance on estimates instead of actual readings, massive water theft, defaulting in water payments and constant disconnection and worst of all a bad public image for the company. The *e-water* payment solution however solved all these concerns with online payments, thus improving the revenue collection and compliance and even went as far improving the utility's image to the point of being awarded the *e-governance* category of the 2nd Annual Communications Innovations Awards for using ICT billing and payment transactions.

Closer to the case study, UMEME Limited, the utility company with the mandate of distributing electric power in Uganda had previously lost revenue through rampant power theft, and non-payment of bills by consumers which led to massive disconnections and this in turn led to severed customer relations and public resentment. From this concern, the utility company rolled out an ICT solution called *Touchpay* that allowed customers to clear their bills and effect real time bank reconciliation through its ICT solutions.

These success stories and many others in the various public sectors including health, education, and agricultural sectors have allowed for implementation of *e-governance* which United Nations Education Scientific and Cultural Organization (UNESCO) describes as the use of ICTs by the public sector to improve delivery of information and services and make government more transparent, accountable and effective.

One of the main reasons why ICT utilization faces a big challenge is the lack of an evaluation framework to measure the effectiveness of ICT adoption and utilization to these parastatals.

2.6. Theoretical aspects for ICT Utilization in Organizations

In promoting ICT utilization for development, Hadden (1996) urges that ICTs have a potential contribution to democratization in societies where there is high political exclusion. Davis, Bagozzi & Warshaw, (1989) suggest that ICT adoption and utilization rests on two cases; that ICTs provide means for access to relevant information and information provided is assimilated, understood and applied as intended and by the intended audiences.

Eason (1988) distinguishes between user acceptability and organizational acceptability of an innovation, saying that as far as user acceptability is concerned, an innovation must offer its

services in a way which its users will perceive, at a minimum, as not threatening aspects of their work and will perceive it as positively facilitating goals they wish to pursue.

2.6.1. User friendliness and innovation adoption

User friendliness (or usability, ease of use or non-complexity) is the degree to which an ICT innovation is perceived as relatively easy to understand and use (Rogers, 2003).

Dawa (2004) refers to the ease of use of an ICT innovation as its usability, quoting the International Standards Organization (ISO 9241-11) as defining usability as "the extent to which a product\system\innovation can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a given context" (Dawa, 2004: 43).

Eason (1988) defines usability of a system as the system offering its functionality in such a way that the planned users in the organization will be able to master and exploit it without undue strain on their capacities and skills. It is in this domain that the importance of user friendliness, ease of use and ease of learning are usually emphasized. The complexity of an innovation, as perceived by members of the organization, is negatively related to its rate of adoption

2.6.2. Accessibility to ICT systems and infrastructure

It is prudent to look at the ICT usage in organizations where the users have a choice and access to ICT systems and applications but aren't effectively utilizing these systems and innovations. The first aspect to look at is the accessibility to these ICT innovations and systems.

McCreadie and Rice (1999) distinguish six types of accessibility:

- Physical accessibility:

Whether or not a potential user has direct access to a service? What technology is needed to use a service or application? How advanced the technology is: is it an entirely new system or a new (software) application that can be implemented in a specific system?

- Affective accessibility:

Whether or not the medium matches the users in the organizations' knowledge and daily activities. The likelihood of a particular ICT medium being used depends on the user's knowledge and behaviour. The central issue here is the interaction of the technology and the users.

- Suitability

Suitability with what needs people are confronted in an organizational context and what opportunities do technologies have to offer. The next question to be answered would be how do the organizational structures develop and it's implication to improving service delivery and efficiency in the organizations.

- User friendliness

This variable is an important determinant of the utilization of ICT systems and innovations in organizations. It serves to show that rather than being crucially important to the success of a technological innovation, the innovation must be seen as a precondition.

2.6.3. The Diffusion of Innovations (DOI) Theory

DOI theory sees ICT innovations as being communicated through certain channels over time and within a particular social system or in this case organization. (Rogers 1995).

Individuals are seen as possessing different degrees of willingness to adopt innovations, and thus it is generally observed that the portion of the population adopting an innovation is approximately normally distributed over time (Rogers 1995).

Breaking this normal distribution into segments leads to the segregation of individuals into the following five categories of individual innovativeness (from earliest to latest adopters): innovators, early adopters, early majority, late majority, laggards (Rogers 1995).

These different adopters include:

Innovators who are venturesome and are educated, show greater propensity to take risks; and are social leaders, popular and educated; Visionaries who appreciate the innovation in order to take a competitive advantage over other firms; Early majority who are deliberate and have many informal social contacts; Late majority who are sceptical, traditional and of low socioeconomic status and therefore block purchase of new technology.

Based on DOI theory at organizational level (Rogers 1995), innovativeness is related to such independent variables as:

Individual (leader) characteristics that look to describing the leaders in the organizations' attitude toward change, internal organizational structural characteristics, and external characteristics of the organization.

Organizational Innovativeness can best be illustrated as below:

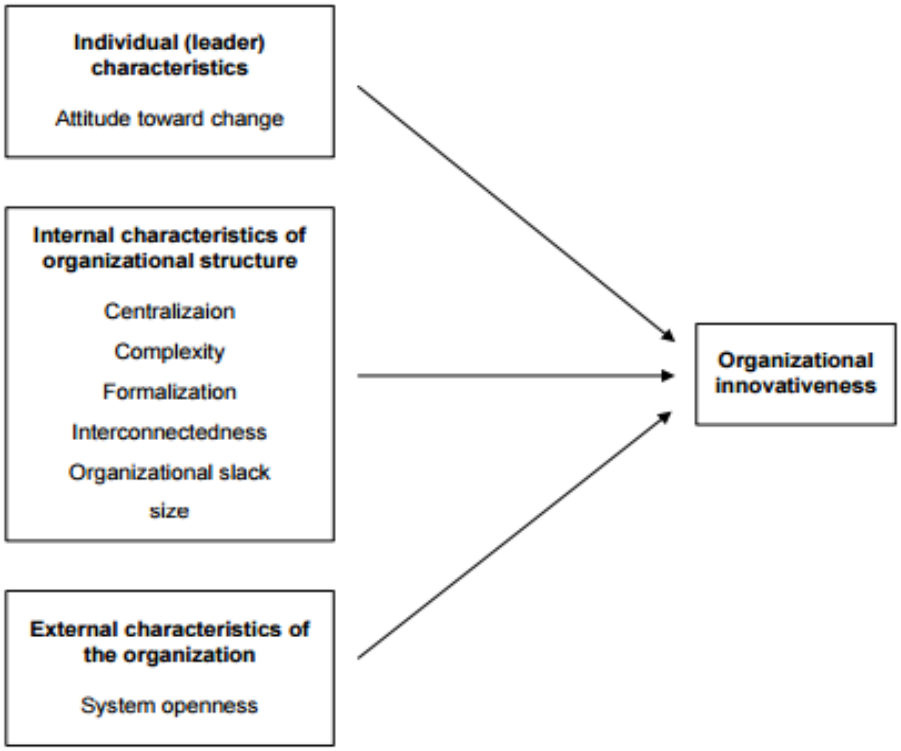


Figure 2.1: Diffusion of Innovations Theory

The strengths of the DOI theory are:

Critical looks at the processes of diffusion of ICT innovations in organizations and the associated factors; reviews the characteristics of the organizational structure to put it into perspective in regards to the utilization of the ICT; looks at the external environment of the organization when adoption and utilization of the ICTs to ensure that the environment within which the organization's operating in has a level of preparedness of the ICT; explains in-depth the role each segment plays in the diffusion process of ICT innovations.

The weaknesses from this framework however are:

Doesn't emphasize the appropriateness of the ICT before its diffusion process can start; doesn't look at the competencies and training of the staff within the organization; doesn't look at support from top management within the organization; doesn't consider the other attributes of the ICT such as the type of ICT's development type, to understand its best-fit nature.

Research based on the Innovation Diffusion Theory assumes that the adoption decision is undertaken to improve operational efficiency (Teo et al., 2003). However, the organizational decision to adopt new technology may be also influenced by the environment of the

organization - customers, suppliers, other trading partners, competitors, and government regulations that provide barriers and incentives to technology adoption.

This theory ideally covers the view from the ICT and its diffusion process into the organization and as such can't be wholesomely added to the proposed framework that aims to emphasize the use of the ICT.

However, the strengths of the DOI theory will be added to the requirements formulation of the proposed framework.

2.6.4. Theory Transformational Leadership

The theory of transformational leadership as introduced by Burns (1978) and subsequently developed by Bass and Avolio (1995), is a relationship such that a leader and a follower motivates each other to higher levels which led to a valuable, mutual and beneficial association for the benefits of the leader, follower and the organization.

According to Yuki, (1998), transformational leaders build commitment to the organization's objectives and empowered followers to achieve those objectives. He cited that transformational leaders were expected to define the needs to change (*and adopt and utilize more efficient and effective ICTs*), create new visions and muster commitment to the vision, concentrate on long term goals, inspire followers to transcend their own interests to pursue higher-order goals, change the organization culture *(to make it more involved in the adopted technologies within the organizations)* and mentor followers to take greater responsibility for their developments and that of others.

The rationale for using Technology has augmented by Qiyun Wang and Huay Lit Woo (2007), is that Technology should be used not because it is available or it has been shown effective in some cases but because Technology can enable the process and enhance productivity of the staff output.

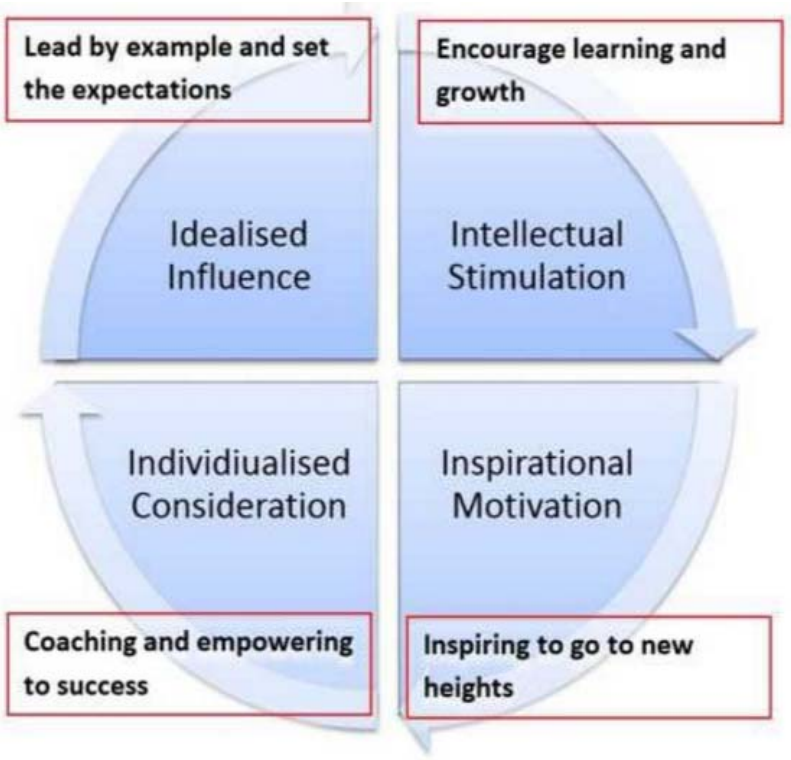


Figure 0-1.2: Transformational Leadership

Lo et al. (2010) have empirically established that two dimensions of transformational leadership styles (idealized influence and intellectual stimulation) have significant effects on three dimensions of commitment to change i.e. personal goals, capacity belief and context belief.

Commitment to change, on the other hand, translates into execution of new objectives and change programmes which is a major necessity for numerous organizations (Jaros, 2010; Conner, 1992; Meyer et al., 2007).

Similarly, (Bass, 1996) observed that charisma, individualized influence for subordinate development and a practice of intellectual stimulation by leaders is critical to leaders whose organizations are faced with needs for renewal and change.

The main limitation of these theoretical framework is that it's attention in mainly directed towards the leadership perspective with the adoption and use of ICTs and doesn't factor in the other key attributes required for ICT adoption and utilization within organizations such as the characteristics of the ICT itself, its functionality etc.

However, the transformational leadership framework offers further attributes that will make up the requirements for the proposed framework. These include; management support to the ICT, inspirational motivation, intellectual stimulation and organizational culture.

2.6.5. ICT infrastructure and ICT utilization

Pearlson & Saunders, (2006) define ICT infrastructure as everything that supports the flow and processing of information in an organization, including hardware, liveware, software, data and network components.

The gap between the infrastructure and utilization of ICT has to be as narrow as possible to have the two factors moving in tandem with each. Therefore, as Forth & Mason (2004) highlighted, ICT facilitators in most organizations include, the computing infrastructure, the organization's intranet and extranet and its' availability, remote access to the organization's ICT infrastructure, level of automation for most of the organization's business processes, electronic data interchange levels within the organization and management support in emphasizing the use of the ICT.

2.6.6. Organisation's Employee skills

Paul and Pascale (2003) findings clearly indicated that ICT adoption and utilization is positively related to user knowledge and skills and that lack of suitable technical and managerial staff with sufficient ICT skills is major barrier for organizations in adopting and utilizing ICT.

More researchers confirm the finding that ICT skill and knowledge levels within the organization are linked with the successful adoption and eventual utilization of these technologies in the organization, such as Cragg & King (1992) who found that one of the strongest inhibiting factors for organizations to implement information technology was the lack of information system knowledge and skills. Allison (1999) also agrees that a skilled and knowledgeable work force was closely linked with the successful implementation of technology.

It is therefore imperative for any organization to determine its employee's levels of knowledge and skill as they will eventually influence the adoption and the utilization of ICTs and as such influence their success or failure rate.

However, another contrary view observed was that an organization's CEO would leave the basic ICT technologies and opt for the more sophisticated ICTs, regardless of their utilization or adoption levels just to be able to have a comparative advantage over the organizations' competitors as this ICT would elevate the technological stand of the company to outsiders.

2.6.7. Theory of Planned Behaviour

Theory of Planned Behaviour among firms, in which they found that for business environments, user perception had a strong direct effect on an individual's intention to use ICTs.

The theory consistently found that top management support is a strong determinant of ICT implementation success. Top management in any organization needs to establish and portray the willingness on the part of the organizational members by creating a climate of cooperation and ownership of the ICT technologies, demonstrating the efficacy of the new system and its benefits over the old ways of doing things. They add that the degree of acceptance or resistance to ICT projects will be due to the degree of top management support for the project

Syed & Mohammad (2009) reported that the greater the benefits perceived the higher the possibility of ICT utilization among organizations. They also claim that organizations have recognized the positive impacts of ICTs such as computer terminals, e-mail and internet to the organization level as well as their applications on business performance.

However other scholars such as Pohjola (1998) suggests that ICT is thought to contribute to overall growth in the long-term and that the primary motivation for the most organizations to adopt new technologies (such as the Web) is the anticipated benefits these technologies will bring to the company (Premkumar & Roberts, 1998).

The same opinion was echoed by Lauder & Westall (1997) who reported that ICT benefits include cheaper and faster communications, better customer and supplier relations, more effective and efficient marketing, product and service development and better access to information and training.

Similarly, Baroudi Igbaria& Parasuraman (1996) found that **usefulness and ease of use** motivates professionals and managers to use computers and that users are more likely to use and adopt computer technology if they think that it is useable and it can improve their productivity.

Arising out of these various studies and the varying findings, the researchers decided to investigate whether such factors such as organisational support, ICT infrastructure and user perceptions are likely to impact on ICT utilization in most organizations in developing countries including in Uganda.

The relationship is conceptualized as below:

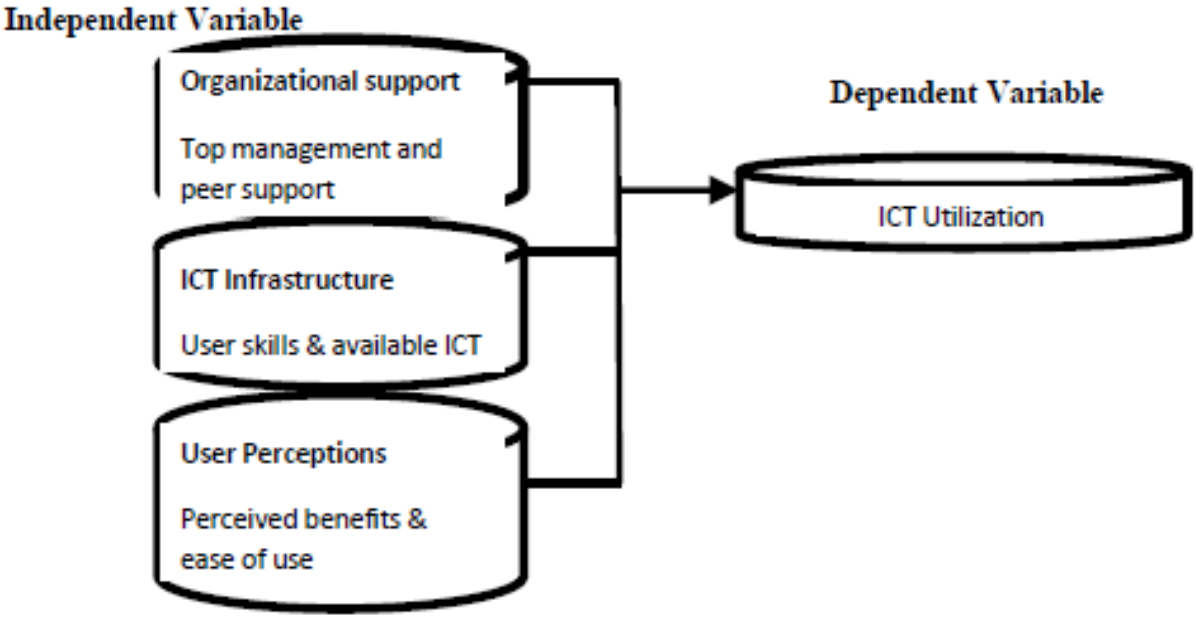


Figure 2.0-2: Theory of Planned Behaviour

2.6.8. The Unified Theory of Acceptance and Use of Technology (UTAUT)

The Unified Theory of Acceptance and Use of Technology aims to explain user intentions to use ICTs and subsequent usage behaviour. It holds that there are four key constructs that are direct determinants of usage intention and behaviour, and the fourth is a direct determinant of user behaviour. Gender, age, experience, and voluntariness of use are posited to moderate the impact of the four key constructs on usage intention and behaviour.

These determinants are further broken down into the following

Performance expectancy: the degree to which an individual believes that using the system will help him or her to attain gains in job performance; effort expectancy: the degree of ease associated with the use of the system; social influence: the degree to which an individual perceives that [other important people] believe he or she should use the new system; facilitating conditions: the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system.

The UTAUT was developed through a review and consolidation of the constructs of previous research that had been employed to explain ICT usage behaviour.

The main strengths of the UTAUT include:

1) its global and integrative approach, incorporating a wide variety of explanatory variables from the main theoretical models and frameworks developed to explain ICTs' acceptance and use

This can be illustrated as below:

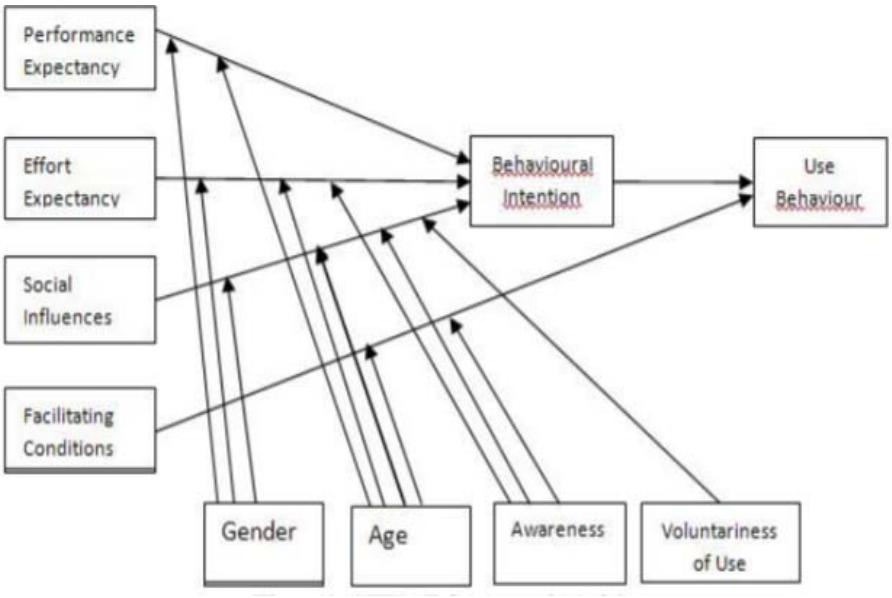


Figure 2.0-3: UTAUT

2.6.9. Summary of theoretical aspects.

Below is a tabulation of the requirements from the theoretical aspects that will contribute to the requirements for the proposed framework.

Theoretical aspects	Requirements collected.
User friendliness and innovation adoption	Ease of use, usability of ICT's
Accessibility to ICT systems and infrastructure	Access to ICT's
Organizational support	Top management, peer influence,
Diffusion of Innovations	Individual characteristic, Internal characteristics of organizational structure, external characteristics of organization.
Transformational leadership	Idealized influence, inspirational motivation, intellectual stimulation, individualized consideration
ICT infrastructure	Availability and reliability of infrastructure and systems

Employees ICT skillset	Level of ICT knowledge skills and ICT training of employees
Planned Behavior	Perceived benefits, user perceptions, organizational ownership

Table 2.1: Theoretical aspects summation

2.7. Theoretical frameworks of ICT usage:

Theoretically, the notion of ICT usage in this case relates to the concepts of ICT usage in organizations and the effects that this utilization can have on the staff performance and productivity in the attainment of the organizations goals and objectives.

In this literature review, frameworks for both adoption and utilization because the adoption process of ICTs especially in organizations have a strong bearing on the eventual utilization of these technologies. If ICT is introduced with poor adoption mechanisms, the intended users can end up refusing to use the ICTs. Therefore, because adoption is very crucial to the utilization process, both frameworks have been reviewed.

2.7.1. Technology, Organization, and Environment (TOE) Framework

The TOE framework was developed in 1990 (Tornatzky and Fleischer 1990) and it identifies three aspects of an organization's context that influence the process by which it adopts, implements and utilizes a technological innovation. It is identical to the Diffusion of Innovations theory framework although but it takes into account also the aspect of external business environment, which can better explain adoption of innovations. These include:

- Technological context

Technological context describes that adoption and eventual effective utilization depends on the pool of technologies inside and outside the firm as well as the application's perceived relative advantage (gains), compatibility (both technical and organizational), complexity (learning curve), trialability (pilot test/experimentation), and observability (visibility/imagination) of the ICT's.

It also describes both the internal and external technologies relevant to the organization. This includes current practices and equipment internal to the firm (Starbuck 1976), as well as the set of available technologies external to the firm (Thompson 1967, Khandwalla 1970, Hage 1980).

- Organizational context

Organizational context captures firm's business scope, top management support, organizational culture, complexity of managerial structure measured in terms of centralization, formalization, and vertical differentiation, the quality of human resources, and size and size related issues such as internal slack resources and specialization (Jeyaraj, Rottman, & Lacity, 2006; Sabherwal, Jeyaraj, & Chowa, 2006; Tornatzky & Fleischer, 1990).

Also explained above, mainly descriptive measures about the organization such as scope, size, and managerial structure, organizational culture.

- Environmental context.

Environmental context relates to facilitating and inhibiting factors in areas of operations. Significant amongst them are competitive pressure, trading partners' readiness, socio-cultural issues, government encouragement, and dealings with the other parastatals and the government agencies. Technology support infrastructures such as access to quality ICT consulting services (Al-Qirim, 2006; Jeyaraj et al., 2006; Scupola, 2009; Zhu, Kraemer, Xu, 2003).

These three elements present "both constraints and opportunities for technological innovation" (DePietro, Wiarda, & Fleischer, 1990, p. 154). Thus, these three elements influence the way a firm sees the need for, searches for, and adopts new technology

This research study will look to extend the TOE framework in coming up with an effective ICT utilization framework in parastatals and organizations.

The TOE framework can be best illustrated as below:

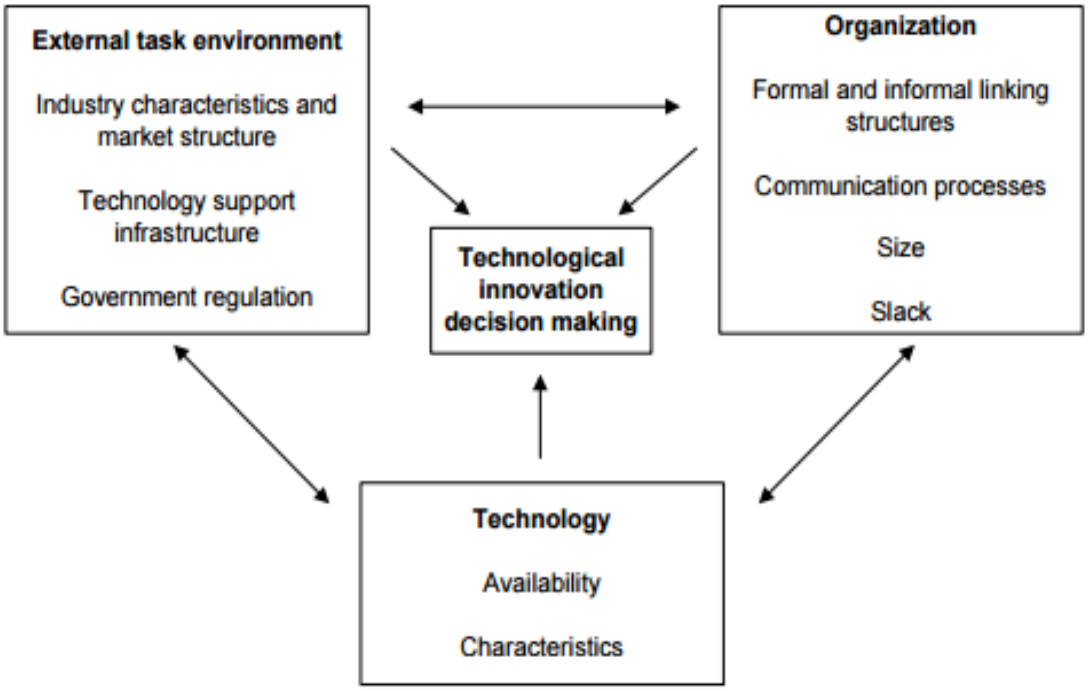


Figure 2.0-4: Technology Organization Environment Framework

The TOE framework will be extended in the requirements gathering for the proposed framework. Its main key strength and key reason why the TOE framework has been selected is that it looks at a broad holistic approach to the issue of ICT adoption and eventual utilization throughout the organizations, putting into perspective the environment of the organization, the Organization itself and its characteristics and the technology itself that is driving the ICT plus the external environment within which the ICT is being brought out from and it's attributes and characteristics.

From there, the framework is going to be extended with other factors and frameworks reviewed from the

2.7.2. The Technology Acceptance Model (TAM) Framework

This framework, adapted from the Technology Acceptance Model, seeks to explain the use of ICT by focusing on the users' attitude towards the technology, and their subsequent intention to use it.

This is a theoretical framework designed by Davis (1989) that proposes a relationship between **users' acceptance of a new ICT** and the individual's users' perceptions of **the ease of use** and **usefulness of the ICT**.

Two key variables formed the framework for the TAM model formulation, and are central in this technology acceptance model: the technology's **perceived usefulness** and its **perceived ease of use**. These perceived system characteristics are expected to influence the organizations' staff's attitude towards the system, which influences their intention to use it, which in turn ultimately leads to their use (or non-use) of the system.

This is one of the most widely used theoretical frameworks in ICT adoption and utilization. Its' two main frameworks i.e. perceived usefulness and perceived ease of use, predict attitudes, which in turn influence the intention to use of a technology. This intention then consequently impacts behaviour of actual system usage.

Perceived usefulness is the degree to which a user thinks a technology would enhance performance or productivity in the workplace.

Perceived ease of use is the degree of lack of effort required by the user in adopting a given technology.

Perceived ease of use also affects perceived usefulness.

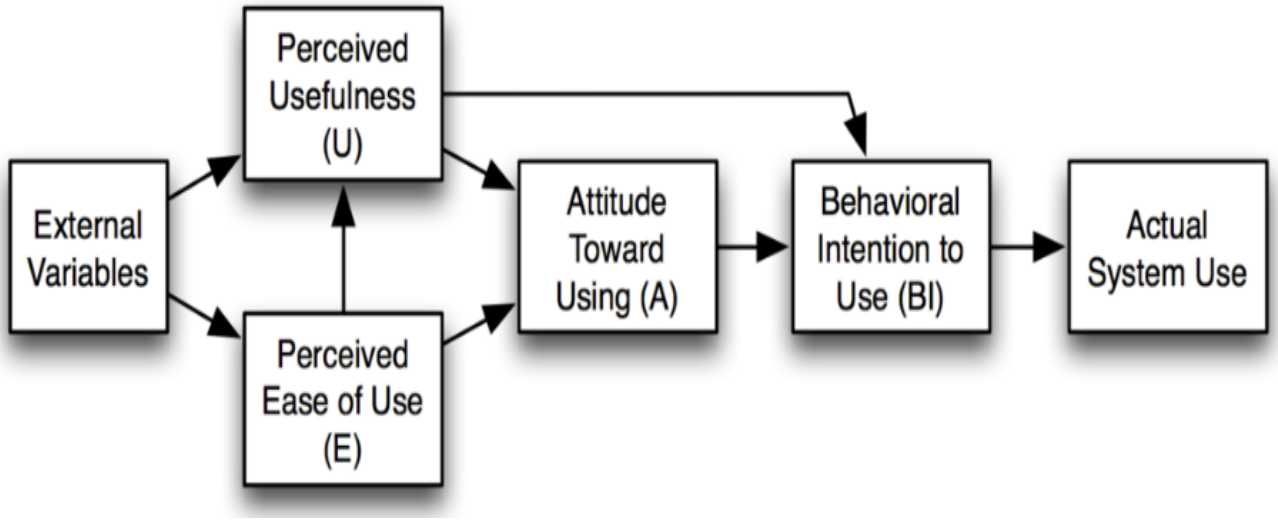


Figure 2.0-5: TAM Framework

The Technology Acceptance Framework is an adaptation of the theory of Reasoned Action (TRA) proposed by Fishbein and Ajzen (1975) to explain and predict the behaviours of people in a specific situation. The theory argues that intention to perform certain behavioural action is a function of both attitude and subjective norm.

Subsequently, when a positive intention is developed, a person tends to really involve in performing the actual action.

However, the weakness cited with this theoretical framework are quite a number and include:

1) Its inability to be applied to non-volitional acts such as those that become obligatory.

When a public organization has endorsed the adoption of ICT as new way of performing tasks, it becomes a non-volitional act that everybody must follow to carry out tasks.

2) It focuses on mainly the individual user and not an organization as a whole which would ideally more applicable since and single user can bring out the use of the ICT.

3) Because it focuses on the individual user, their way of perceiving an ICTs' usefulness could be hard to gauge to get them to use the innovation and thus slow down the adoption and the utilization of the innovation.

4) It also ignores the critical aspect of the ICT development opting to bring out the usefulness to the individual user than the focus being applied to the innovation's development process and implementation.

Because this research is applying the focus on promoting ICT usage in organizations, the TA framework cannot be applicable to it but only a few attributes will be collected to contribute to the requirements gathering for the proposed framework. These are: perceived ease of use of the ICT, perceived usefulness of the ICT, behavioural intention to use.

2.7.3. Iacovo et al. (1995) Model

Lacovo et al. (1995) analysed interorganizational systems (IOS) characteristics that influence firms to adopt ICT innovations in the context of Electronic Data Interchange (EDI) adoption and utilization.

Their framework is well suited to explain the adoption of an Interorganizational Systems but can also point to the utilization of the adopted IOS. It is based on three factors: 1) perceived benefits, 2) organizational readiness, 3) external pressure.

Perceived benefits is a different factor from the TOE framework, whereas organizational readiness is a combination of the technology and organization context of the TOE framework. The Lacovo et al. framework mainly looks at the interorganizational systems which have to exchange data for example commercial banks, and this can also apply to public organizations such as tax bodies and civic duties organizations will also contribute greatly to the requirements gathering of the proposed framework. Key factors to pick up from this framework include:

1) Organizational readiness
2) perceived benefits of the ICT

3) External pressures to cause for the adoption and use of the ICT

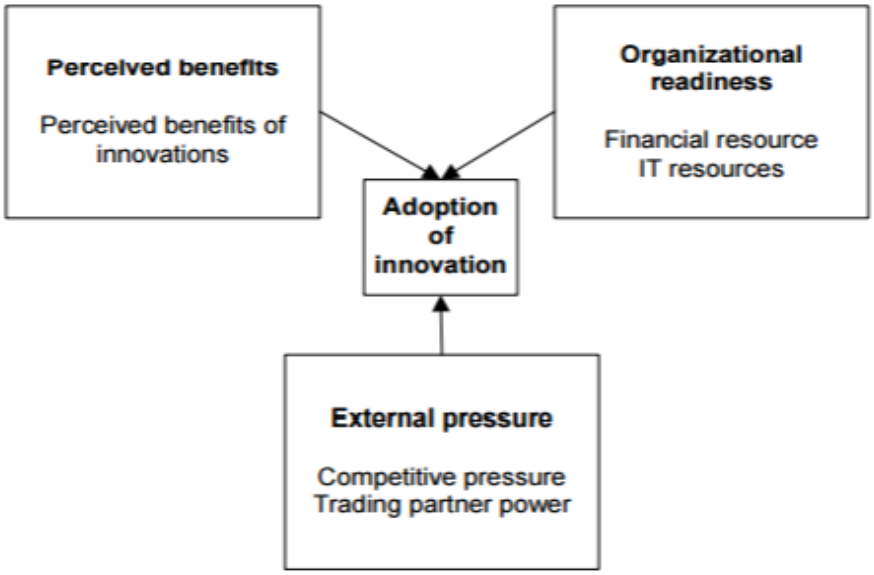


Figure 2.0-6: Lacovo et al Framework (1995)

2.7.4. Task Technology Fit (TTF) Framework.

Task-technology fit is "the degree to which a technology assists an individual in his or her portfolio of tasks" (Goodhue and Thompson, 1995). "The heart of the task-technology fit framework is the assumption that ICT innovations give value by being instrumental in some task or collection of tasks and that users will reflect this in their evaluation…" (Goodhue, 1998).

Furthermore, it also states that the ICT's are more likely to have a positive impact on individual performance and be used if the capabilities of the ICT match the tasks that the user must perform (Goodhue and Thompson, 1995).

The Task Technology Fit theory together with IT systems use was found to be a significant predictor of user reports of improved job performance and effectiveness that was attributable to their use of the system under investigation.

Task-technology fit is conceptualized according to 'fit as profile deviation' (Venkatraman, 1989). A profile is an ideal specified situation; the less a real situation deviates from the profile, the higher the fit.

Since the initial work, TTF has been applied in the context of a diverse range of information systems including electronic commerce systems and combined with or used as an extension of other models related to IS outcomes such as the technology acceptance model (TAM). The

TTF measure presented by Goodhue and Thompson (1995) has undergone numerous modifications to suit the purposes of the particular study.

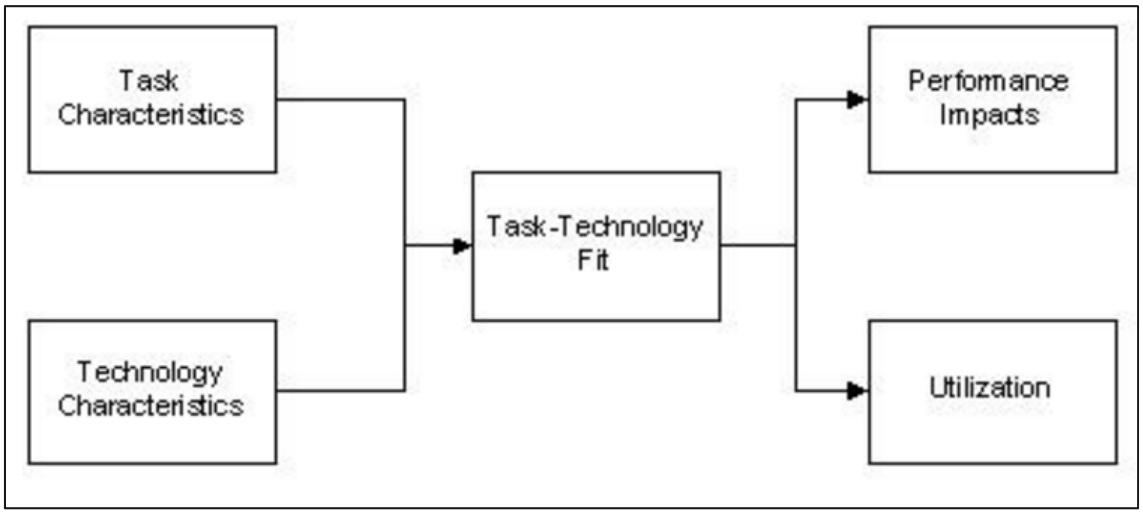


Figure 2.0-7: TTF Framework

From the TTF theoretical framework, the technology characteristics can be picked up as a requirement for the proposed framework.

2.7.5. Summary of Frameworks reviewed.

Below is a tabulation of the requirements from the frameworks reviewed that will contribute to the requirements for the proposed framework.

Table 2.2: Summary of Framework

Frameworks\Models	Requirements collected.
TOE	Availability and characteristics of technology, organization's characteristics, External environment of the environment.
TA	Perceived usefulness, perceived ease of use, behavioral intention to use,
Lacovo	Perceived benefits, organizational readiness, external pressures
TTF	Applicability of user tasks in the organization, characteristics of the technology

2.8. Theoretical frameworks summary.

From the literature reviewed and selection of the TOE framework to expound on, ICT utilization within the organization can be attributed to three main factors: the technology factor, the organizational context and the environment of the technology and organizations.

These are then further broken down to form the requirements of the proposed framework's model into the following:

Top management support

This ensures that the use of the ICT's will get the required resources and capabilities. There is a positive effect of leadership support on innovation adoption. ICT usage can potentially influence the organization's competitive position as well as its business relationships, therefore it is important that top management need to get involved in order to gain a good understanding of the issues surrounding ICT adoption and use in the organization.

Transformational leadership

The organization having leadership who are dynamic and interested in improving the way the organization's working to better and more efficient and effective work practises.

Organizational culture

The pre-existing culture in the organization can also affect the adoption and the use of the ICT's introduced into the organization. Therefore the culture and the attitudes of the organization have to be adjusted towards innovations changes in relation to the ways of doing things.

Organizational competency

The availability of employees with adequate experience and exposure to information and communication technology and other skills (such as business strategy) that are needed to adequately staff ICT adoption and implementation projects that eventually lead to the use of these ICTs in organizations.

More so, the organization competency also plays a big role in the use of ICT in organizations in order to create efficiency in the work culture.

ICT capability

The level of ICT resources (systems and hardware infrastructure) and personnel ICT knowledge\skills and exposure of an organization. Access to adequate equipment in the organization is also known to be a major determinant of the adoption (*and eventual use*) of new technologies. (Newcomer and Caudle, 1991.)

An organization's ability to appreciate an innovation, use it and apply it to new ways is largely a result of the organizations knowledge and experiences in areas related to the intended innovation.
Therefore adoption and use of an ICT requires organizations to possess ICT skills and knowledge.

ICT innovation characteristics
These can be broken down further into:
Perceived benefits: the perceived advantages that the ICT poses over the rest of the alternatives.
Perceived complexity: the extent to which the innovation is considered hard to use and understand. New ideas that are simpler to understand are adopted faster than those requiring the adopter to develop new skills and understanding (Rogers, 1995).
Akbulut (2002) state that the complexity of a technology has a major effect on the adoption decision, while Chwelos et al. (2002) state that complexity is a strong inhibitor of intent to adopt innovation. This all affect the use of the ICT eventually.
Perceived compatibility: extent of compatibility to existing needs, values, past experiences and technological infrastructure of the potential adopters. An ICT might be perceived as technically or financially superior in accomplishing a given task, but it may not be adopted, if a potential adopter views it as irrelevant to its needs (Rogers, 1995).
Applicability of the technology to the task: the more applicable and fitting the technology is to the task the higher the likelihood of it's being adopted and used in the organization.

Market readiness
This refers to the assessment that an organization's business partners such allow an electronic conduct of business" (Molla & Licker,2005). For any organization to use ICT into its business culture, it has to be mindful of the other sector players in the market and their perspectives to ICT adoption and use.
Supporting industries
Since organizations would rather concentrate on their core competencies, it is vital that there are other organizations whose main activity is provision of ICT infrastructure and services.

Frameworks Identified	Key attributes for ICT utilization	Limitations	Comment
Technology, Organization and Environment The three aspects of an organization's context that influence the process by which it adopts, implements and utilizes a technological innovation:	• Technology context - Availability - Characteristics • Organization - Formal and informal linking structures - Communication processes - size - slack - Employees ICT skill set - Organizational support • External task environment - Industry characteristics and market structures - Technology support infrastructure - Government regulation.	ICT training for the users Continuous evaluation of the innovation to ensure effectiveness and utilization. Doesn't consider Management and peer support to ICT's Doesn't consider uses access to ICT facilities	Most appropriate for the requirements gathering for the proposed framework. This framework will be extended to be used for the proposed framework
Unified Theory Acceptance and Use of Technology Direct determinants of user acceptance and of usage behaviour of ICT innovations in organizations.	- Performance expectancy - Effort expectancy - Social Influence - Facilitating conditions - Existence of ICT infrastructure	Doesn't consider uses access to ICT facilities Doesn't look at Transformational leadership within the organization Doesn't look at ICT training for the users	Only selected attributes were - Performance expectancy - Social influence - Facilitating conditions Which will be used during the requirements gathering for the proposed framework.
Transformational leadership	- Idealized Influence of ICT utilization - Inspirational Motivation	Doesn't look at the ICT characteristics	Idealized Influence Intellectual Stimulation

Theory that alludes ICT utilization to transformational leadership.	- Intellectual Stimulation - Individualized Consideration	Doesn't consider the environmental \ external pressure	Inspirational Motivation
Task Technology Fit	Task Characteristics + Technology Characteristic = **(Task-Technology Fit)** =Performance Impacts + Utilization		Task – fit technology Task–Performance
Technology Acceptance framework Focus on the users' attitude towards the technology, and their subsequent intention to use it.	The technology's perceived *usefulness* and its perceived *ease of use*. The intention to *use* the ICT, which in turn ultimately leads to their use (or non-use) of the system.	Doesn't consider The environmental \ external pressure ICT training for the users Organizational competence	Perceived ease of use Perceived usefulness Intention to use Attitude to innovation

Table 2.3: Requirements for Proposed Framework

2.9. Chapter summary

In summary, this chapter has reviewed a number of frameworks, theories and concepts related to ICT, Organizations and ICT usage mainly in organizations. It has been established that the type of technology, the organization type and the environment within which the organization operates in are all very key ingredients in the adoption and eventual effective use of ICT within these organizations

A number of requirements have been established and collected to populate the ICT usage promotion proposed framework's requirements lists.

In the next chapter, we're going to use the requirements we've generated and the conceptual framework that has been developed to collect data within the research case study in line with proposing a framework for promoting ICT usage. The research design will be developed to enable the collection of adequate and relevant data that will be helpful in the formulation of the framework.

CHAPTER THREE: RESEARCH METHODOLOGY

3.0. Introduction:

This chapter presents the methods and procedures that were deployed to conduct this research study.

Cohen, Manion and Morrison (2000) state that methodology in research refers to a systematic way of gathering data from a given population so as to understand a phenomenon and to generalize facts obtained from a larger population.

Methodology embraces the research design, population, instruments used to collect data, data analysis and its interpretation, ethical considerations, measurement of variables. Methodology therefore helps the researcher and the reader to understand the process of the research thus giving it scientific merit.

The research study was about the looking at how the requirements gathered from the literature reviewed in chapter 2 are relevant\key to the utilization of ICTs and how these requirements can be added to the formulation of a framework that can be applied to have an effective utilization of ICT within parastatals.

This research study was carried out within UETCL which is the case study where this research study will be conducted.

3.1. Research Approach

The study adopted an interpritivism philisophical paradigm, aslo referred to as social constructionism.

Interpretive research in the reference to ICT is concerned with understanding the social context of an ICT; this means the social processes by which it is developed and constructed by people and through which it influences, and is influenced by, its social setting (Oates, 2006). It is an approach that enables researchers to consider, the social context of systems and how these systems are influenced and can influence the setting (Galliers, 1991; Klein and Myers, 1999; Oates, 2006).

Williamson et al. (2002) further argue that the interpretive approach is often (although not exclusively) associated with qualitative research techniques. The interpretivist approach was adopted since more explorations are required on the research topic, in order to put forward

recommendations that will assist proposing a framework for the use of ICT within the public sector.

There are two common types of research approaches used in research namely inductive and deductive research approaches.

Inductive research begins with the researcher collecting data that is relevant to the topic and only when considerable data has been collected will the research develop a theory to explain the patterns of data.

Deductive approach is when a hypothesis is developed from an already existing theory. The researcher usually studies what others have done and then tests the conceptual works that emerge from those theories.

The main difference between these two is deductive approach aimed at testing a theory while inductive research aimed at generating a new theory emerging the data collected.

Inductive approach was qualitative research design while deductive approach was quantitative research design.

Quantitative research designs is a way of collecting numerical research or data which then can be converted into usable statistics, using data to formulate facts and uncover patterns and uses quantitative technique.

Qualitative research design however is used to gain a deeper understanding of the subject matter and helps develop ideas. The common methods used are narrative research, case study and grounded theory.

A case study design with qualitative research techniques mainly interview is used to collect data.

For this study used a mixed method is selected which uses both qualitative and quantitative methods of data collection.

3.2. Research Design

This research adopted both a quantitative method involving questionnaires and qualitative method.

In this case, qualitative method was used to explore the question of what is going on in Uganda Electricity Transmission Company Limited with regards to ICT utilization and its effectiveness in the enhancing operational efficiency.

Qualitative data results were presented descriptively, whereas quantitative data results was summarized in tables and charts.

3.3. Population and Sampling Design

3.3.1 Target Population

Also according to Frankel and Wallen (2000) a population refers to the group to which the results of the research are intended to apply. The group of people to whom the research results will apply.

The research population was 70 which consisted of 50 UETCL staff from the departments in the organizational unit selected and shown in chapter one, 20 respondents from parastatals in the same sector and business partners.

Table 3.1: Total Population Distribution

Description of respondents	Targeted sample size
UETCL Staff	**50**
Electricity Sector Players	**20**
TOTAL	70

3.3.2 Sampling Design, Sampling Techniques and Sample Size

3.3.2.1 Sampling Frame

A sampling frame is a complete list of all the members of the population that is to be studied. A research sampling design is that part of the research plan that indicates how cases are to be selected for observation. The design therefore maps out the procedure to be followed to draw the study‘s sample.

A sampling frame is a list of elements from which the sample is actually drawn and is closely related to the population under study (Cooper and Schindler, 2003). In this study, the sampling frame constituted of UETCL management, employees, and other sector players.

3.3.2.2 Sampling Techniques

The sampling techniques included the random sampling method in the determination of customers to be included in the study.

Random sampling which can best be defined as a method of selecting a sample (random sample) from a statistical population in such a way that every possible sample that could be selected has a predetermined probability of being selected, was used when the various sampling units satisfy certain criteria of interest.

In this study, the chosen group was management, supervisors and key staff from UETCL and other energy sector players.

Random sampling technique (Lottery Method) was also employed to ensure fair representation of individual members in the groups selected for the study. A random sample is a subset of individuals (a sample) chosen from a larger set (a population). The group was chosen randomly and entirely by chance, such that each individual has the same probability of being chosen at any stage during the sampling process, and each individual has the same probability of being chosen for the sample (Yates, Daniel, Moore and Starnes, 2008).

3.3.2.3 Sample size

Sample sizes taken were as indicated in table below. The sizes varied because of the varying numbers of management and supervisory employees that fell in each category. On the side of the costumers and sector players who are mainly UETCL business partners, however, only fifty samples were targeted, and this was expected to give a fair representation of the overall population.

Table 3.2: Research Sample Sizes

Category	No. of Respondents
UETCL Senior Management team	21
UETCL Officers and below	15
UETCL Major sector partners	8
Key Public sector partners	6
Total	**50**

3.4. Data Collection Methods

3.4.1. Primary data collection methods

Both primary and secondary sources of data were used to collect data in the research.

Primary data was collected using a self-administered online questionnaire which comprised of both close-ended and open-ended questions.

3.4.2. Survey questionnaires

A questionnaire can be defined as a formalized schedule or form which contains an assembly of carefully formulated questions for information gathering (Wong, 1999).

The choice of the questionnaire was based on the facts that: it is a quick method to collect data, it is less time consuming, it is able to cover the entire sample within the proposed time frame, and it offers greater assurance of anonymity.

The questionnaire consisted of three parts:

Part I sought to gauge level of seniority and the level of training and exposure to both existing and new technology innovations in the organization,

Part II sought information perceptions and attitudes of respondents toward using ICT services.

Part III looked at the perceived usefulness of these ICT services and their applicability to the users.

Part IV sought to pick views from the respondents on how and what can be done for ICT utilization to attain organizational efficiency and staff performance improvement. Part of the questionnaire sought management responses on the level of effectiveness of ICT utilization to the organizational goals and objectives.

All responses to items on perceptions/attitudes towards ICT utilization were measured with a guide of a Likert scale ranging from 1= strongly agree to 5= strongly disagree to determine respondents.

3.4.3. Interviews

There were also face to face interviews with key management and senior staff and also interviews with key users of ICT innovations within UETCL.

These interviews were recorded and replayed to be able to document the findings objectively and apply the findings to the research.

3.4.4. Observation data

During the course of the research, observation was collected during visits to particular offices to observe how ICT innovations were being used in the business operations, people, and whatever else was deemed relevant to the research.

Observatory data was also used during the benchmarking study visits to the partner companies in the same sector

3.4.5. Secondary sources of data

Secondary source data was obtained from the internet, and UETCL website, other partner energy sector players in Uganda's strategic plans for example, Electricity Regulatory Authority, Uganda Electricity Generation Company Limited, Uganda Revenue Authority, Kampala Capital City Authority etc., white papers and journals, Newspapers, magazines, and other relevant literature.

3.5. Research Procedures

After the research questions were developed from the research objectives, a research questionnaire with the specific questions to be asked was drawn up.

A pilot review of a select group of key ICT operators was carried out to evaluate the completeness, precision, accuracy and clarity of the questionnaires.

This ensured the reliability of the data collection instruments used. After the amendment of the final questionnaire, the researcher explained the purpose of the research and sought permission from the institution to carry out the actual research.

The final questionnaires were distributed to the respondents through online media sources such as email, and the intranet web portal.

Each completed questionnaire was treated as a unique case and a sequential number given to each.

During data collection attention was given to make sure that the quality of the data was not compromised. A comparison was made of the data before cleaning and that after (an effect of data cleaning).

The data collected was presented in the form of tables and charts. Information that could not be tabulated was described and written out.

The technique of descriptive analysis was used to analyse collected quantitative data and thereafter summarise the basic features of the quantitative data using tables and charts.

Filling the questionnaire took approximately 10 minutes.

3.6. Data Analysis Methods

To ensure easy analysis, the questionnaires were coded according to each variable of the study. This study used descriptive statistics. According to McDanile and Gates (2001), descriptive analysis involves a process of transforming a mass of raw data into tables, charts, with frequency distribution and percentages, which are a vital part of making sense of the data.

In this study, the descriptive statistics such as percentages and frequency distribution were used to analyse the demographic profile of the participants.

The demographic data was tabulated using frequency and percentages. In order to describe the data, the study used percentages to interrelate data on the key research questions.

3.7. Ethical Considerations

The primary goal of ethics in research is to ensure that no one is harmed or suffers adverse consequences from research activities (Cooper and Schindler, 2001). The following were done to ensure that the respondents' rights are protected:

1) Informed consent was sought and granted from the concerned company authorities before conducting the study,
2) Respondents were selected for their willingness to participate without compulsion, and no risks to the respondents could be identified at any stage during the research.
3) The researcher also articulated it to the participant that the information collected from them was to be regarded highly as case of confidentiality.
4) The respondents were also not obliged to give response to any questions where they felt uncomfortable or just simply could not give any answer during the study questions.

3.8. Chapter Summary

This chapter presents the various methods and procedures the researcher adopted in conducting the study in order to answer the research questions raised in the first chapter.

The chapter is organized in the following ways: the research design, population, sampling design, Sampling Techniques and sample size, data collection methods, research procedures, data analysis methods, ethical considerations ,philosophical grounding and study limitations .

The next chapter presents the results and findings of the study

From the literature review carried out in Chapter 2, requirements for the proposed framework on ICT utilization in organisations were established and with these requirements, a conceptual framework was developed with which the research study will seek to come up with.

In chapter 3, the methodology with which the research will be conducted has been explored using the requirements that were selected from the literature reviewed and the conceptual framework generated.

The next chapter, the findings of the research carried out will be presented and analysed to refine and propose the extended conceptual framework

CHAPTER FOUR: PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

4.0. Introduction

This chapter presents findings of the research study in line with the general and specific objectives and their interpretations.

These are findings both from literature research, library research through various media, from empirical study through interviews conducted and questionnaires distributed as discussed under data collection methods.

Data collected was presented, analyzed and discussed, which were also used as a guide by the researcher in the design of the questionnaire. The analysis and discussions are the basis for drawing conclusions and making recommendations that should help in making the development of a framework for the effective utilization of ICTs in organizations.

4.1. Survey response rate

A total of fifty (50) online survey questionnaires were distributed during the survey, within the case study organization (UETCL) and an additional 30 sent to external partners of UETCL. However, within UETCL, 58 questionnaires were responded to. This makes the response rate of 76% of the 70 questionnaires electronically sent out.

Externally of the 30 questionnaires sent out to UETCL's major sector partners and key public sector partners, only 24 were responded to, making it a 70% response rate.

These response rates were considered sufficient enough is to facilitate the intensions of this study.

4.2. Demographic statistics of Respondents

4.2.1. Age

The age of the respondents was considered to be important for the study. The result is shown in the figure below.

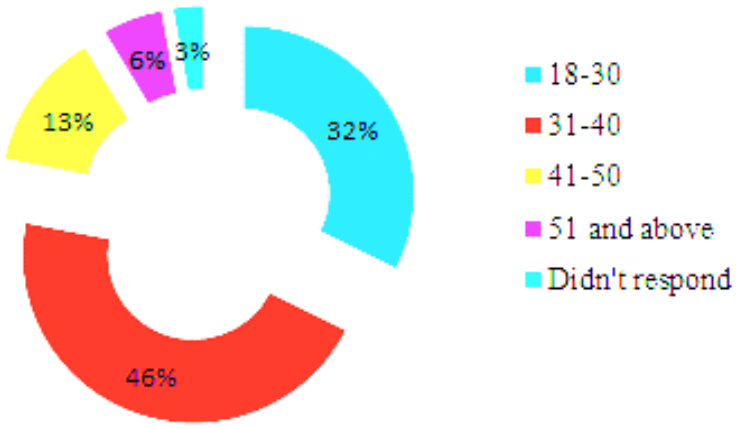


Figure 4.1: Respondents age

Most employees are between 31 – 40 years of age, the most active age bracket implying that UETCL is preparing young employees for leadership positions and so it's important that they appreciate ICT utilization.

4.2.2. Gender

The gender of the respondents was considered to be important for the study. This result is shown below.

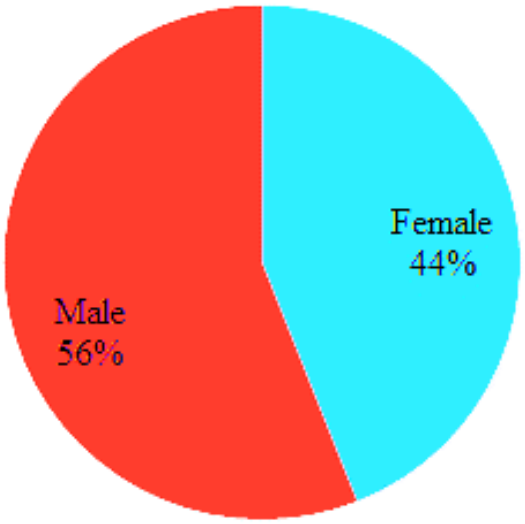


Figure 4.2: Gender characteristic

This result shows that there was a gender balance during the research process therefore the response will not be gender biased.

4.2.3. The Seniority level in the organisation:

Being the key decision makers in the organization, responses from the various seniority levels were very key to the gathering of information pertaining to the ICT utilization in organization. These are shown below.

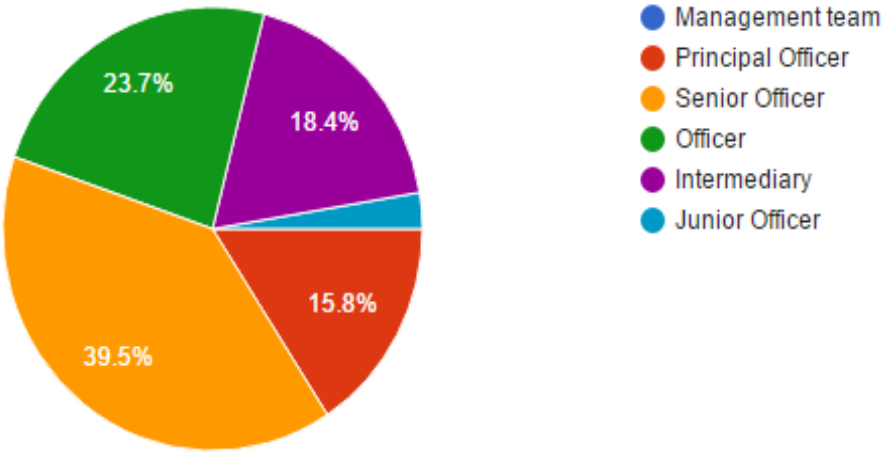


Figure 4.3: Seniority levels

The majority of the respondents were senior officers in the organization who are mostly the hands on employees that are most affected by the business processes efficiency in the organizations.

4.2.1. Type of ICT

Different types of ICT's (information systems, applications, mobile apps) all have their separate functionality within them and this also affects how the technology users will appreciate them. The figure below shows the importance of the type of innovation and how it'll be appreciated

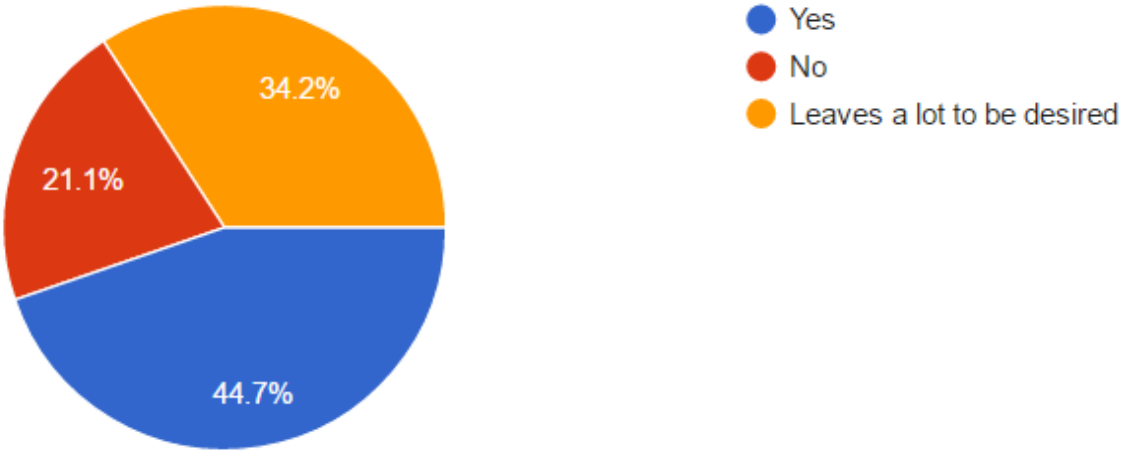


Figure 4.4: ICT Type appreciation

This result shows that the type of ICT innovation being introduced deserves attention for it to be utilized effectively.

4.2.2. Technology factor of the ICT

The technology type is also very key in the use of ICT within organizations to derive value from them. Different technology types have their own unique factors that can affect their utilization. These can include, the platforms the ICT's run on, the skill set of the users of the ICT's, the observability of the innovation, among others.

4.2.3. Enablers of ICT utilization

From the research study, the enablers for effective ICT utilization were identified as follows:

i) 90% of the respondents identified peer support and encouragement as an enabler for ICT utilization in the organization even when faced with other alternative manual means of getting a task\work done.

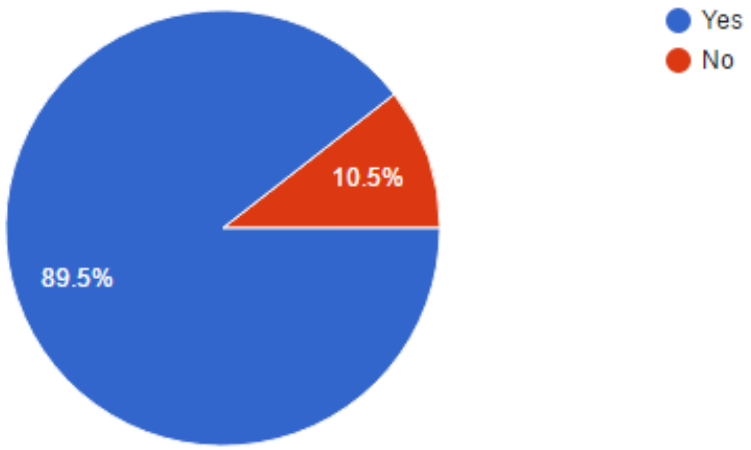


Figure 4.6: ICT Use Peer support\Social Influence

This result shows that social influence in utilizing ICT innovations is key.

ii) 58% of the respondents identified emphasis of supervisory authority as an enabler to the utilization of ICT although 8% disagreed and 34% were non-committal.

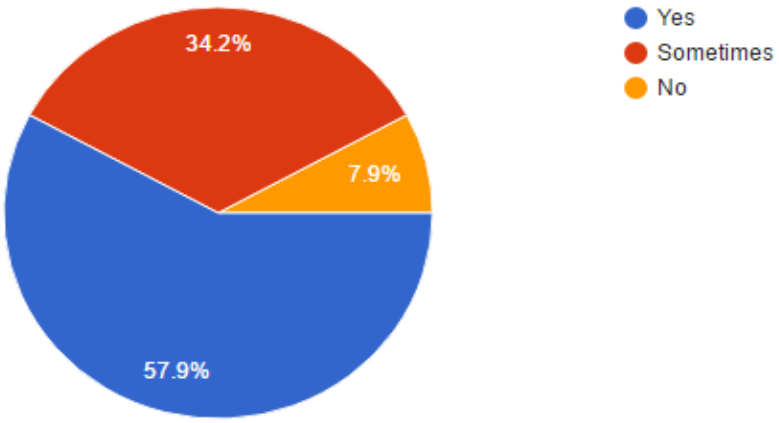


Figure 4.7: Supervisory support to ICT Use

This result highlights the management support has to influence ICT utilization.

iii) 50% of the respondents also identified the *reliability of ICT systems and applications* as an enabler to utilizing ICTs

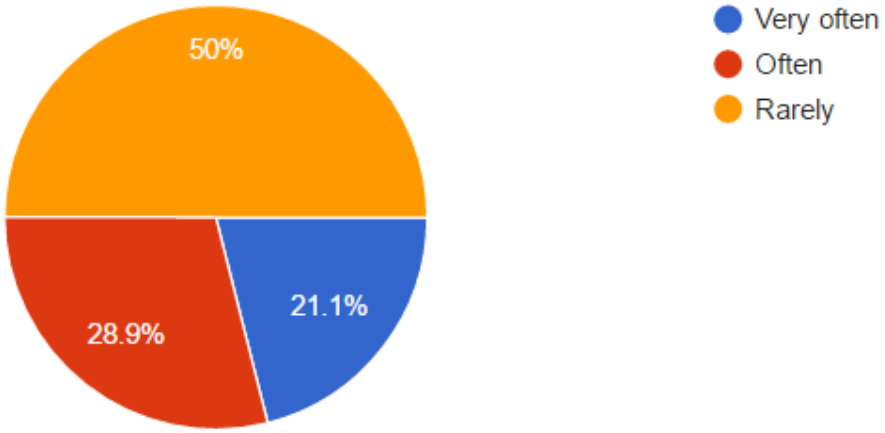


Figure 4.8: Reliability of ICT

This result shows that ICT innovations have to be very reliable for the organization to embrace them effectively.

iv) 76% of the UETCL employees attributed ICT utilization to *top management support.*

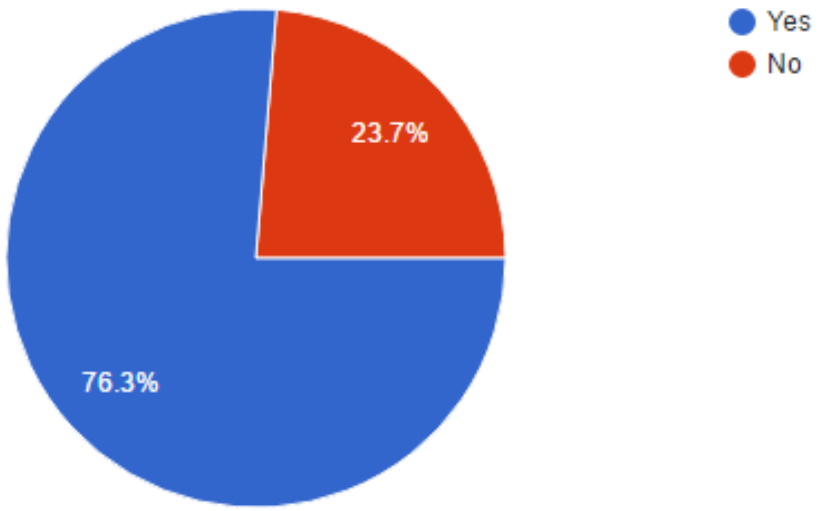


Figure 4.9: Organizational Ownership of ICT

4.2.4. Employees\ user perspective on ICT usage

This criteria looked at ICT use from the perspective of the employees or the users of the ICTs adopted in the organization and brought out the following:

i) 41% of the respondents said that they had access to ICT facilities in execution of their duties at the work place. However the majority didn't have access to ICT facilities which is key to their utilization.

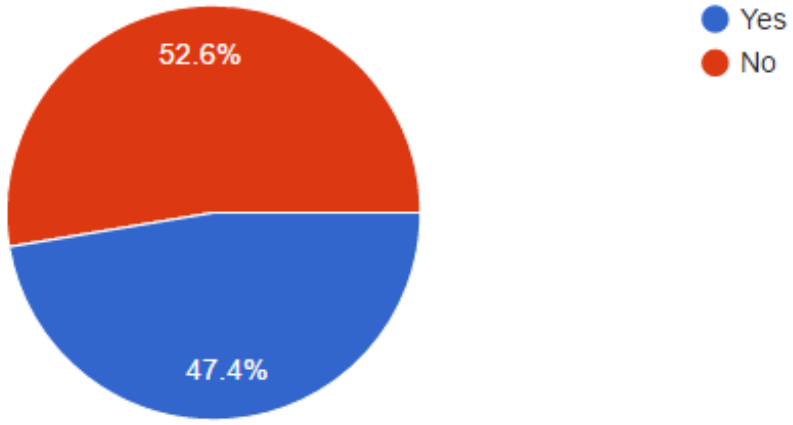


Figure 4.10: Access to ICT facilities

ii) 81% of the respondents found ICT applications\systems *easy to understand* and to use thus contributing hugely to the effective utilization of ICTs.

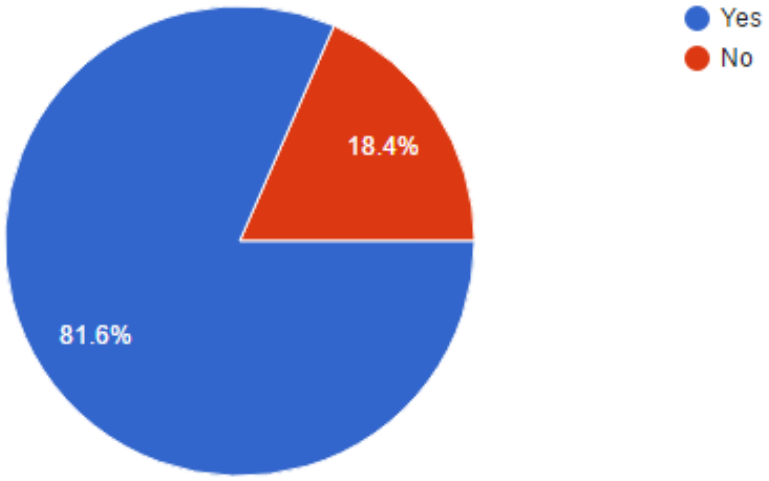


Figure 4.11: Usability and Ease to Understand

iii) Of the respondents, 71% of the respondents agreed that ICT applications\systems in UETCL perform to their expectations and of course this encourages their continuous utilization.

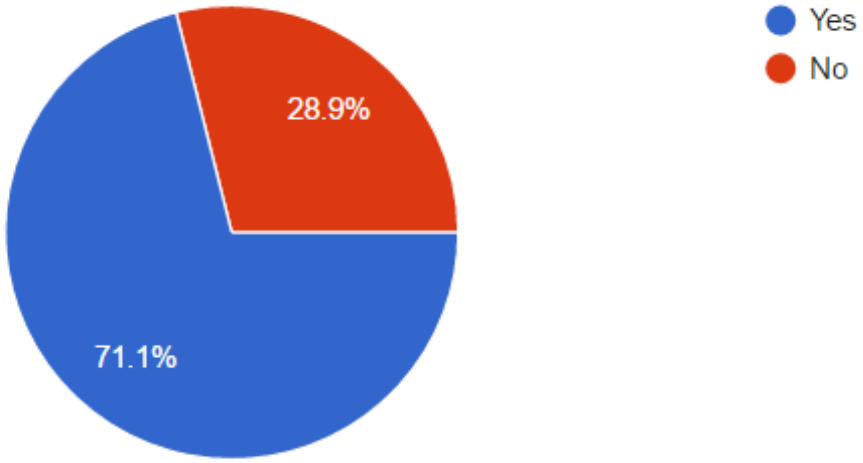


Figure 4.12: Performance Expectancy

iv) Furthermore, 32 out of the 38 respondents also collaborated that ICT adoption and utilization are key business drivers and strategic partners to UETCL achieving its goals and objectives. This therefore emphasizes and stresses the need for ICT utilization within the organization.

v) From the above pointer, it can also be argued that with the 97% of the respondents feeling that ICTs have improved their communication with their respective stakeholders through the ICT utilization.

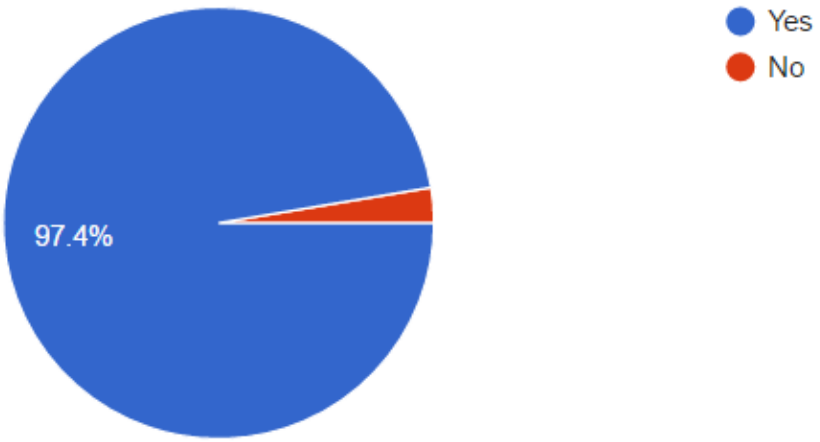


Figure 4.13: Improved communication through ICT

vi) Also, 60% of the respondents responded that they felt that effective ICT utilization gave the company a competitive edge over other parastatals in Uganda and 50% of the employees felt that the company adopting and effectively utilizing ICT made them stand out among their peers and proud employees in UETCL.

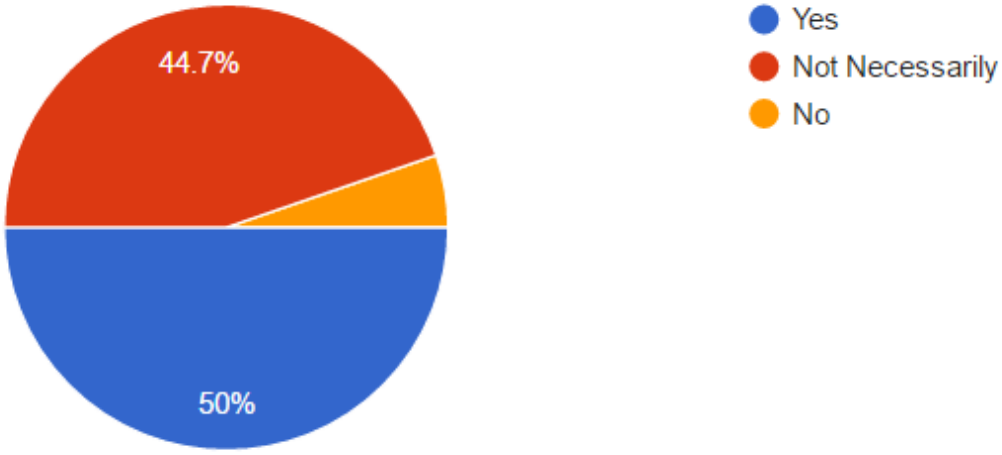
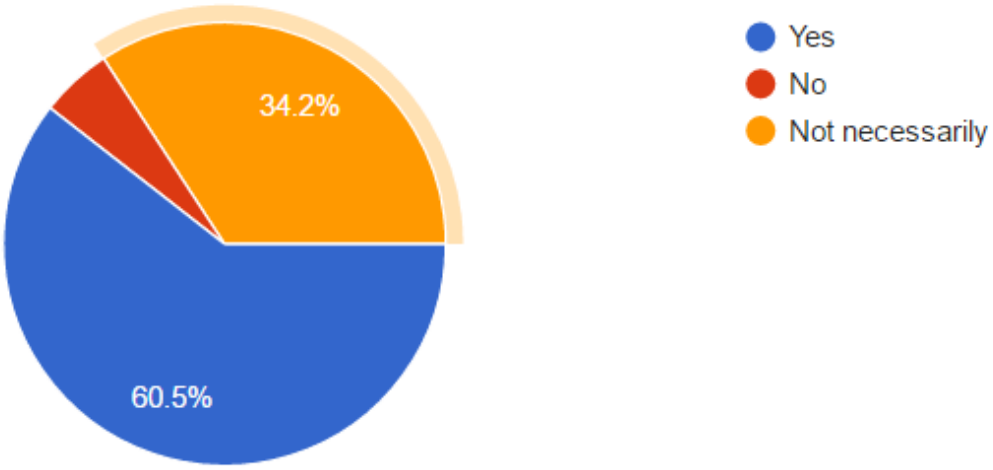


Figure 4.14: ICT innovation value addition



vii) However, the employees in the organization highlighted the key attributes of ICT usage.

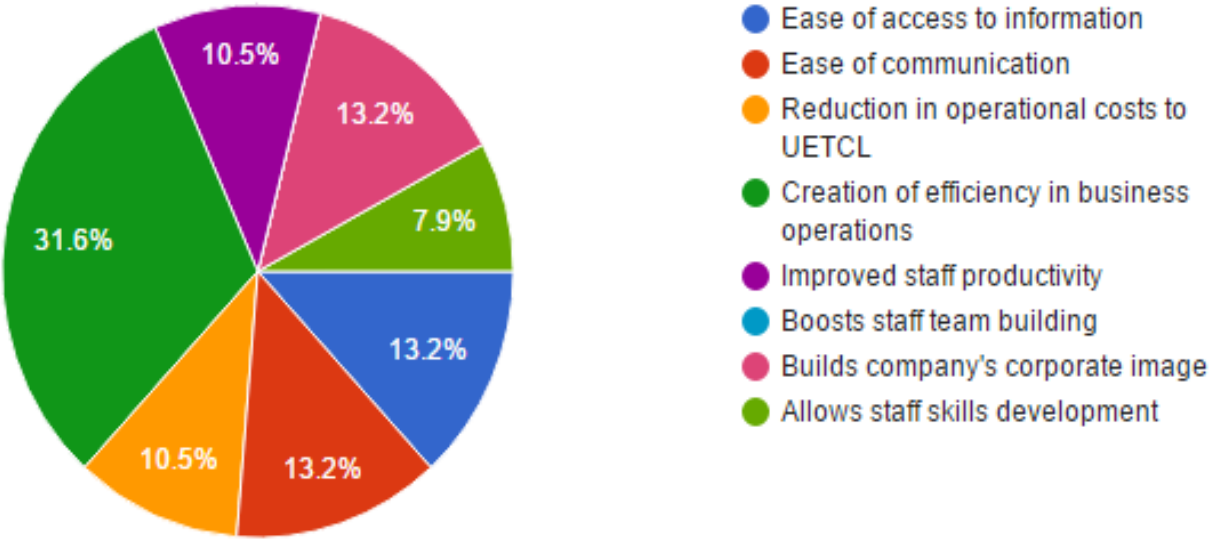


Figure 4.15: Key achievements of ICT

From the result, it clearly stands out that the biggest achievement to the organization from ICT usage creation of organization efficiency.

4.2.5. Understanding ICT usage in the UETCL

From the data collected from the various respondents of this study, it was clear that the impact of the ICT usage has many factors that hold it back from being as effective as it should be and thus impeding its effectiveness.

From the face-to-face interviews carried out in UETCL, among both the management and key staff, it was evident that ICT use was a little concept, being mostly confused with ICT adoption. I informed the respondents that this was research is to establish the effectiveness of utilization of the already adopted ICTs to impact on operational efficiency and effectives in attaining the set goals and objectives.

There was an apparent misunderstanding between the utilization of ICT and it's effectiveness to organizational efficiency and the adoption of ICTs. The respondents were further informed that this study is taking into account the level of effectiveness attributed to the utilization of these ICTs and not necessarily only looking at the adoption of ICTs into their organizations.

4.2.6. Limitations to ICT Utilization in the organization

The issues that many of the interview respondents in UETCL had as limiting factors to effectively ICT utilization and its effectiveness included;

i) A *lack of ICT training* where 48% of the UETCL employees lacked training on especially new ICT's and an additional 29% of the respondents expressed a lack of training in commonly used ICT applications

ii) *Ineffective ICT integration into business processes*, was also raised by 34% of the respondents,

iii) 26% of the respondents said the *unreliability of the ICT infrastructure and systems* as a limiting factor.

iv) Also, from the research conducted, especially within the Public Relations and Communications staff, I noticed that a lack of exposure\awareness of the power of social media platforms was highlighted as another limiting factor to the effective utilization of ICTs. Many of these social media platforms are continuously being used as communication platforms and have been widely embraced into communications policies and effectively used by the private sector and can also be of value to public companies.

These limitations are expressed as below:

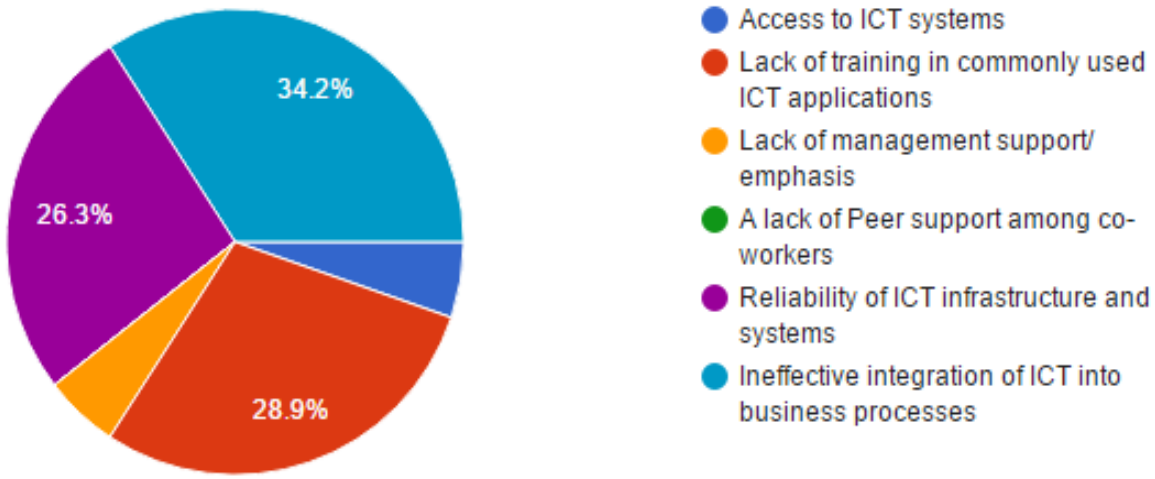


Figure 4.16: ICT use Limiting Factors

The result shows that the ICT's integration into the organization's business process is very important to ICT use.

4.2.7. Recommendations for ICT usage

From the research study conducted, the recommendations that can be put up to push for ICT utilization within the UETCL include:

i.) Providing more skills and capacity development to the staff within the organization to enhance the ICT utilization levels within the organization

ii.) More management support promoting the adoption and usage of ICTs among the staff in the organization over manual business processes.

iii.) By creating awareness within the organization about the importance of ICT adoption and the effectiveness that ICT utilization will provide to the organization it's attainment of the organization's goals and set objectives.

4.2.8. ICT usage in other key public sector organizations

The research study for comparison and alternative views and also to be able to get a view from the environment in which the case study operates in to extended to other public companies to find out how ICT use is ensured.

4.2.8.1.Kampala Capital City Authority (KCCA)

This is the authority that is mandated and responsible for the operations of the capital city of Uganda, Kampala. This is done through various instruments such as revenue collection, providing social services, and building infrastructure in the city center and its environment.

A face to face interview which was also recorded for future reference, was conducted with the Business Process Reengineering team unit under the IT department that looks at the different processes within the organization and their existing interrelations.

From the interview, the following were established in regards to ICT utilization. The strategies that are applied to ensure adequate and effective utilization of the adopted ICT technologies included:

i.) Within the KCCA organization structure, the ICT team ensures that ICT's are comprehensively marketed among all the employees so that all the employees can feel and see the impact that the innovation aims to have, the problems it aims to solve and the efficiency impact it will have to the organization's goals.

ii.) Through involvement of enterprise architecture framework which have been used to reengineer the business processes of the organization, this has led to a cut down of redundant business processes and also allowed the integration of more ICT resources to cut down on the manual repeated processes that are in use. Enterprise architecture frameworks such as The Open Group Architecture Framework (TOGAF), ITIL have been adopted in their business process reengineering processes and modelling.

iii.) The use of ICT's within the organization has also been accelerated by ensuring that there is a standardized development of innovations that seek to how to match ICTs to the business needs of the organizations. For every IT project with an IT component\ or automation of a business process, there's a system structure of :1) Business Process Reengineering team: 2) Technical team: 3) User acceptance team 4) Quality assurance team 5) Monitoring and evaluation team 6) Change management team

These teams all work in tandem with each other to ensure that ICT innovation has met a business need and naturally this leads to the innovation's utilization on the face of older manual systems.

iv.) The organization also ensures continuous capacity growth and development in ICT technologies and skills throughout the entire organization to allow the full effective utilization of ICT technologies with the knowledge that would have been obtained from the continuous development. The key uniqueness about this training is that the focus is on the entire organization and not just taking a selected group within the organization.

v.) The organization has also embraced best practices that have also led to the utilization of ICT's. some of these have include:

Enforcing security controls among the ICT users to prevent security breaches which can easily undermine the utilization of these ICT's.

Minimizing printing costs through restricting unnecessary printing of information that can be otherwise shared electronically.

Through establishment of an IT service desk management adapted from the ITIL model framework that ensures that all the reliability of the ICT applications and systems in use in the organization are working and as such their functionality and usability is appreciated by the users in the organizations.

4.3. Situational analysis of ICT usage in UETCL

There was no accessible framework for ICT use however after observing the operations of the ICT department during the research.

From the field study conducted, it was indeed evident that there wasn't much focus on the use of ICT resources within the organization. Most of the focus is directed towards adopting more and more ICT technologies and minimal attention is given to how these technologies are effectively utilized to add value, effectiveness and efficiency to the way the organization's stride in achieving the goals and objectives.

However, from the research survey that was carried out, 65% of it was evident that the employees and management appreciate the value that ICT adoption and effective utilization can give the organization.

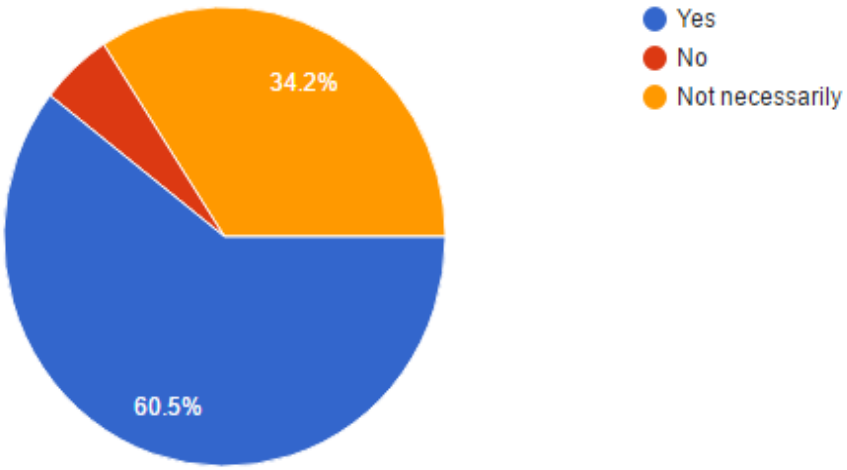


Figure 4.17: Appreciation of ICT adoption

From the research in UETCL, the utilization and adoption of ICTs can be regarded as very low and inadequate with under 50% of the staff feeling that ICT has been utilized effectively. This is shown in the figure below.

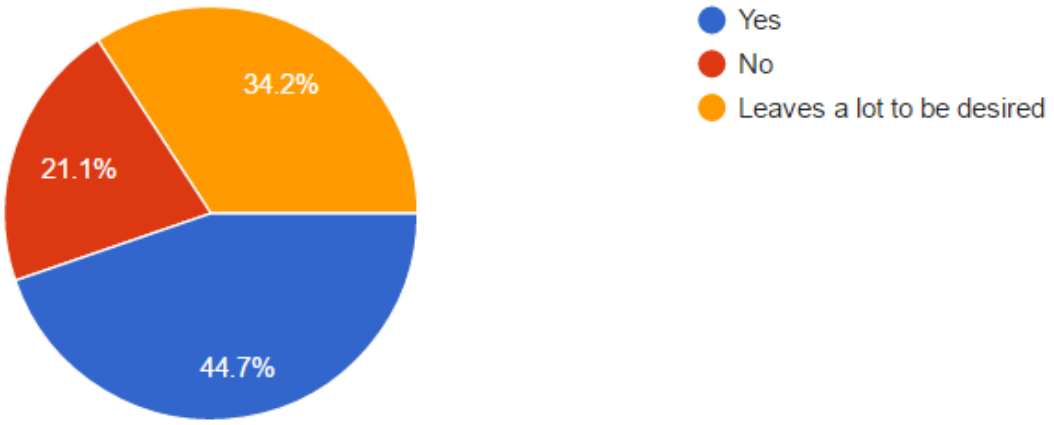


Figure 4.18: Inadequate ICT utilization

However, ICT adoption and utilization can be combined into one and backed by the following strategies it can be properly utilized in the organization. Some of these include:

1.) Automation of business processes.
2.) Development of applications and information
3.) Formulating policy papers and documents that guide the utilization of these ICTs
4.) Continuous skills development among ICT staff to make use of newer technologies.
5.) Seeking management support for ICT's.

However, for this research study, attention was the automation of business processes.

As earlier reviewed from KCCA, automation of business processes will always lead to the utilization and adoption of ICTs in any organization. In UETCL, business processes have been automated to have a transition from paper-based\ manual management and leading to the adoption of more computerized\ digital management processes that are online based. This has encouraged more utilization of ICTs to be able to carry out any of the required business processes, and in part also increased the adoption of the technologies with more robust ICT equipment being procured to have the more, wider coverage to the online systems by all staff of the company.

Some of the business processes that have been automated include; requests for allowances, stores requisition vouchers, budgeting processes for activities, etc.

Some of the ICT's that have been adopted and have pushed more utilization of ICTs within UETCL include:

The Budgeting Information System that was basically adopted to manage the budgeting process in the entire organization, automating internal business processes through processes UETCL web portal, Wayleaves Information System which is mainly used during the acquisition of land within the wayleaves corridor for the transmission line projects, Geographical Information Systems (GIS), critical business applications such as SUN systems for the financial accounting, inventory control and procurement initiation, DRL for Human Resource management, PSSE for power line simulation, ACL for auditing among many others.

Therefore, this goes to show that there's general consensus that effort has been put in adopting ICTs and this has in one way or another had the utilization of the ICTs contributing to the growth and performance of the organization. What remains to be establish is the extent of the effect of the utilization of these ICTs on the performance of the organization and in its goals and objectives.

Opening access to the ICT platforms across the internet has been another strategy that has in its own way to push for more ICT adoption and utilization by allowing global access to ICT systems and applications to all authenticated users.

However, even with the perceived advantages that the adoption and utilization of ICT in UETCL has had there have still been many challenges that have held back the utilization and adoption of further technologies. These include: lack of management support, lack of organizational ownership of the ICT's, limited ICT capacity skills development among the staff in the organization particularly on new and emerging technologies has been another challenge that has seen a sharp decline in the utilization of ICTs in the organization, bad organizational culture and bad attitude, ineffective integration of ICT into the business processes of the organization, unreliability of the ICT infrastructure and systems, unstructured development of applications and systems. Another key challenge that could improve on the utilization of ICTs in UETCL and contribute to the growth in organizational efficiency and effectiveness is through business process reengineering to cut down on redundant unnecessary processes within the operations of the company. Some of these ICT utilization challenges can be directly attributed to the irregular business processes within the organization that also make the employees within the organization. Business process reengineering can allow for the adoption and effective utilization of ICTs as the organization tries to get more effective and efficient in their execution of its duties and attaining of its set objectives.

4.3.2. Strategies to effective ICT utilization in UETCL

There are however, some strategies that can be adopted to allow for ICT utilization to grow to levels of having visible value addition in the organization. These are highlighted as: seeking more management support, adoption of ICT Project management theory and practices during applications\systems development, adoption of business process reengineering as a strategy to improve on its efficiency and effectiveness, continuous skills development, continuous ICT sensitization seminars to change the organizational culture of disregarding ICTs within the organization.

4.4. Requirements for the Proposed a Framework

The requirements for the proposed framework have been picked from the literature review, from existing frameworks on ICT utilization and also from the case study of the research. These have been categorized and shown as follows;

Table 4.6: Reviewed requirements

No.	Theory\Framework	Requirements Identified
	Diffusion of Innovations	Leadership characteristics Organizational internal structure External organizational characteristics
	Planned Behavior Theory	Organizational ownership ICT infrastructure User perceptions
	User friendliness and innovation adoption	Ease of use User friendliness Non-complexity level of an ICT.
	Organizational support	Top management support Peer\social influence
	ICT infrastructure	Availability and reliability of infrastructure and systems
	Employee's ICT skillset	ICT knowledge skillset and training
	Unified Theory Acceptance and Use of Technology Theory	Perceived benefits Organizational readiness External pressures Social influence
	Technology Acceptance framework .	Perceived usefulness Ease –of-us Intention to use
	Transformational leadership	Idealized Influence of ICT utilization Inspirational Motivation Intellectual Stimulation

	Task Technology Fit	Task fit technology Faster solutions
	Technology, Organization and Environment Found to be best fit for the proposed framework and to be extended accordingly.	
	Technology Context	Availability Characteristics
	External task environment context	Industry characteristics and market structures Technology support infrastructure Government regulation
	Organization context	Formal and informal linking structures Communication processes Size Slack

4.4.4. The Proposed ICT utilization Framework

This study proposes a comprehensive, multidimensional framework for evaluating ICT utilization effectiveness.

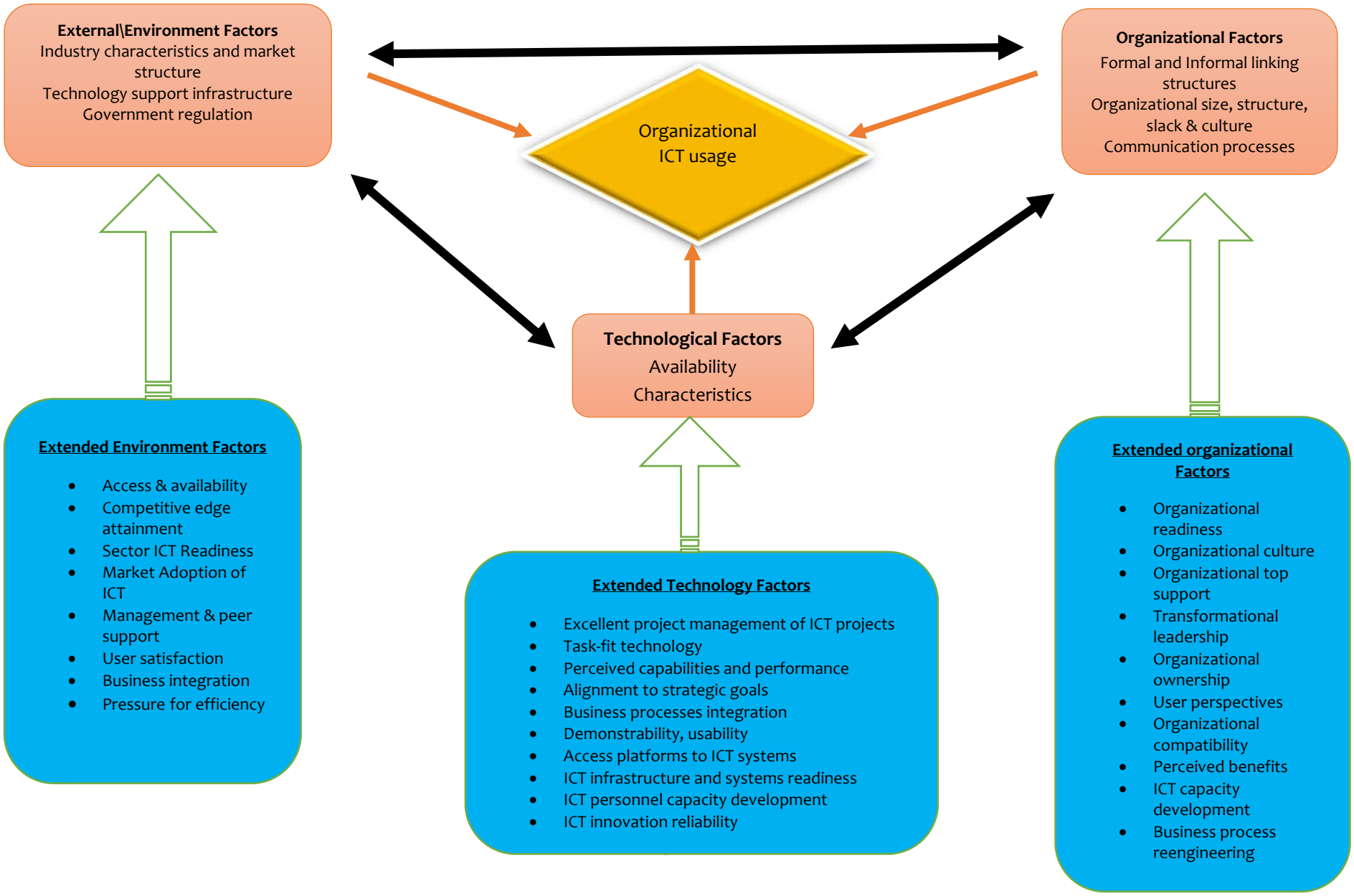
The proposed framework is extending the Technology-Organization-Environment (TOE) framework described in Tomatzky and Fleischer's *The Process of Technological Innovation (1990) which is an organization-level theory that explains that three different elements of a firm's ICT context influence adotption and eventual utilization decisions.* These three elements are all poised to influence the technological innovation adoption and utilization in organizations and best represents the environment surrounding the use factors for ICT in this case study.

The three elements of the TOE framework that are explored are the technological context, organizational context and the environmental context and these all relate to the factors key to ICTs' adoption and utilization. Therefore this framework has been used because it's the best fit with its three key factors that are very important to ICT use.

The measures used in this work were adapted primarily from previous studies; the dimensions of the proposed ICT utilization framework are shown below.

In reference to literature review finding in chapter 2, every study has been interpreted and classified information quality criteria and conforms to its context.

Proposed ICT Usage Promotion Framework



It can be seen from the proposed framework that to ensure effective utilization of ICT and attainment of the benefits thereof, the following factors must be met:

i.) Technological Factors:

These were drawn from the various theoretical aspects of ICT usage earlier reviews in chapter 2. These points were selected mostly from the previous studies done by Goodhue and Thompson (1995), Rogers (1995), Hadden, (1996), Syed & Mohammad (2009). The selected technological factors picked out include: Best fit to task technology, system user friendliness, Ease of use of the ICT, Communicability, demonstrability to the intended users, perceived consistency to the organizational needs, multiple access platforms, reliability of the infrastructure on which the innovation runs.

However, from the case study of the research study, the following factors were also noted and were added to the essential factors necessary for ICTs' utilization. These included adherence to alignment to strategic goals of the organization during development, support service to the innovation, reliability of the innovation, best fit to solve the problem identified

ii.) Organizational ICT factors

From the literature reviewed, many factors were identified as key in the organization to ensure that ICT is used. Some of the scholarly articles cited were selected from Pearlson & Saunders, (2006), Forth & Mason (2004), (Anderson, Bikson, Law, & Mitchell, 1995; Gehrke 2004:), Reynolds (1994), Lacovo et al. (1995), and these included employees ICT technical knowledge and skill, readiness of the ICT infrastructures, access to ICT systems, perceived benefits.

However, from the findings in the case study and the benchmarking that was done during the research study, other factors identified and deemed necessary as key factors for ICTs in organizations were, Computing Infrastructure platforms readiness Setting up business process reengineering units, reliability of the network infrastructure and systems, Acquisition of knowledge Training level & skills of ICT personnel, defined deployment processes and methods of the innovation, Continuous Monitoring and Evaluation of the innovation to ascertain innovation effectiveness, continuous training of organizational staff to transfer knowledge and raise appreciation and awareness of ICTs, continuous seminars to raise awareness on ICT trends to boost utilization.

iii.) Environment\External factors

From the literature review that was carried out the external\environmental factors to the organization are essential in the ensuring, ICT is used. These included: readiness of the market,

competitiveness of rival organizations, external pressure for business opportunities, Communication processes outside the organization, Organizational top support to ICT innovations

4.4.5. Framework Validation

Validation is a key part of the model/framework development process which increases confidence in the model/framework and makes it more valuable (Kennedy et al., 2005). Winter (2000) argues that "validation" is not a single, fixed or universal concept, but rather a contingent construct, inevitably grounded in the process and intentions of particular research projects and methodologies. Validity determines whether the research truly measures that which it was intended to measure or how truthful the research results are (Golafshani, 2003).

The validation of a model/framework is the process of confirming whether the proposed model/framework is appropriate, especially in the light of the purposes of the investigation (Frees, 1996). Egbu (2007) describes the validation of a model/framework as the process of assessing the ability of the model/framework to do what it sets out to achieve. This process attempts to ensure that the model/framework represents the characteristics of the general population and is not peculiar to the samples used in its estimation (Hair et al., 1998). According to Ankrah (2007), the validation process thus seeks to assess the extent to which the models predict the outcomes in terms of performance above or below average.

4.4.5.1. Methods Adopted for Validation

Internal Validation: Egbu (2007) notes that internal validation seeks to outline the strength of the model/framework as well as assess the literature search. Internal validity concerns the credibility of the inferences made from the data while external validity concerns the generalisability of the findings (Eisenhardt and Howe, 1992; Kirk and Miller, 1986).

External Validation: It is about ensuring the robustness of the research and about assessing its generalisability (Rosenthal and Rosnow, 1991; Fellows and Liu, 1997).

External validity was achieved in this research by comparing the findings with similar findings from previous studies (Eisenhardt, 1989). Participants who took part in the first and second phases of the research were invited to share their opinions on the research findings and recommendations in a questionnaire survey. Although the sample size used for this validation exercise is relatively small, the feedback received is generally encouraging and suggests that the research findings and recommendations have the potential of being well received.

Participants' Response: This was the method used to validate the proposed framework**.** A selection of 9 top managers within the case study were presented with the proposed framework, a questionnaire with a copy of the research framework highlighting what was expected of them for the validation process. These were sent out via email and reminders were also made over the telephone**.** Of the 9 top managers who were sent questionnaires for the validation, 7 responded. Out of the 7 responses, comprising of those that participated in the initial survey and interview. Although the sample size used for this validation exercise was relatively small, the feedback received was generally encouraging and suggested that the research findings and recommendations had the potential of being well received.

The majority of the participants were in favour of the outcome, indicating that the framework is a positive contribution to the further development of ICT use. In addition some of the respondents provided their comments about the framework which has been incorporated in this chapter.

The use of the previous participants is based on their prior involvement in the earlier survey/interviews which makes them familiar with the research and would ensure a good response rate. Taking one's findings back to the subjects being studied where the people can verify the findings, has been argued by Silverman (2006) as being that one can be more confident of their validity. This method is known as respondent validation (Silverman, 2006).

The overall analysis indicate that the framework can help improve the use of ICTs in creating organizational efficiency in pursuit of the goals and objectives of the company if adopted.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Summary

This chapter provides a summary of the findings, conclusions and recommendations of the study, based on the data presented and interpreted in Chapter 4, and the research experience gained during the research process. It also gives suggestions for further research that can be built upon by other research. A summary of the research report from the study objectives to the results is also presented in this chapter.

For the study to get to fruition, three objectives were laid out as milestones for this study; the main objective was to draw out a framework for ICT utilization effectiveness in parastatals.

Specifically the research study sought to:

i.) Examine the existing frameworks on ICT utilization with a focus on parastatals to determine the requirements for the proposed ICT utilization framework. This was done by reviewing literature presented in chapter 1. The Technology Organization Environment framework described in Tomatzky and Fleischer's *The Process of Technological Innovation (1990),* was selected among the reviewed frameworks to be most appropriate and extended for the study. It looks at ICT adoption and utilization in three aspects, the technology factor, the organization factor and the environment in which the organization operates in. The existing semblance of the current framework was looked at together with its strengths and weaknesses and was presented in chapter 4 and finally the requirements for the proposed framework were also presented in chapter 4.

ii.) Proposing a framework to promote ICT utilization with the requirements already determined. The proposed framework extended the three aspects in the Technology Organization Environment framework, adding additional factors to each of those three aspects as shown in the proposed framework.

iii.) Validation of the proposed ICT utilization promotion framework for completeness and accuracy of the proposed framework. This was done by the top management of UETCL who were selected for the validation process.

Table 5.1: Research report summary

OBJECTIVES	METHOD	CONTRIBUTION
Examine existing frameworks on ICT utilization with focus on parastatals	Literature review	Theoretical Analysis of needs requirements
Propose a framework that can be applied to measure the effectiveness of ICT utilization.	Mixed Method: Qualitative (Case study) Quantitative (Survey) (Questionnaire)	Framework
Validation of the identified framework model with focus on UETCL case study.	Empirical Study	Validated framework

5.2. Conclusion

I recommend that this framework is incorporated into the current policies of the organizations under the parastatals sector that is key to efficient public service delivery.

The proposed ICT utilization framework has been validated, found true when adopted, will ensure that parastatals attain operational efficiency and effectiveness of the adopted ICT innovations within their organizations.

In parastatals in Uganda, the already adopted ICT solutions have been under-utilized as a result of a lack of utilization framework to ensure not only adoption but go the extra mile to ensure effective utilization.

This study has presented a new framework which when adopted will improve utilization of ICT solutions in organisation's for ICT to create a meaningful impact on the organizational efficiency.

5.3. Recommendations

The preceding sections under this chapter and all chapters have shown that ICT utilization is essentially an appropriate technology advancement on top of the adoption of ICTs that can promote operational efficiency and effectiveness within parastatals in creating faster public service delivery to the public.

This therefore implies that if ICT utilization frameworks are incorporated in the adoption of ICTs within parastatals, overtime, there will be a noticeable efficiency in the dissemination of public services to the public and also these organisations' staff can will cease to have challenges over willingness to utilize or adapt to these services.

Much has many have embraced and adopted ICTs, there has to be an even more important task to make sure that these ICTs are effectively utilized other than having many ICTs that can even be redundant and not necessary to these enterprises

The proposed framework for ICT effectiveness can also evaluating also be used as a reference for ICT implementation planning and improvements amongst other areas of the public administration in Uganda. However the study also has some limitations.

5.4. Limitations of the research study

However the study also has some limitations.

a) Because of time constraints the study did not cover as many respondents as could have been achieved particularly with other similar sector players in the parastatals sector.

b) The study also did not look at the level of ICT adoption that some of these enterprises had as some of them had made more strides in the ICT adoption than the others.

c) Lastly regulatory bodies like the National IT Authority Uganda, Ministry of ICT, and Uganda Communications Commission (UCC) were not involved in this study.

5.5. Suggestions for Further Research

This study suggests that with ICT adoption and utilization the parastatals can perform even more effectively and efficiently. Therefore, further reading should be focused on aspects of emphasizing further ICT adoption in more parastatals particularly those that haven't taken to utilizing ICT resources and are still utilizing outdated and backward means of working.

The adoption and also continuous review of success factors for the utilization can also become a research field to come up with better frameworks and policies that these parastatals have abide by in regards to ICT adoption and its utilization.

Another further area for further reading is the advancement of ICT adoption and utilization into other arms of government that are basically concerned with taking services closer to the public for example the Uganda Police Force, which can greatly benefit from the utilization of ICT particularly in execution of their duties.

In further research studies, the scope should be made broader to involve the entire public sector for more realistic towards ICT utilization and evaluating its effectiveness and impact on the public sector's performance.

References:

TOM NYVANG and CAMILLA ROSEEUW POULSEN: Implementation of ICT in Government Organizations - user driven or management driven?

HARRY BOUWMAN, JAN VAN DIJK, et al: Information and Communication Technology in Organizations: Adoption, Implementation, Use and effects

Sinfree Gono: Challenges of ICT Adoption by South African SMEs: A study of Manufacturing and Logistics Firms.

IDISEMI APULU, February 2012: Developing a Framework for Successful Adoption and Effective Utilization of ICT by SMEs in Developing Countries: a Case Study of Nigeria.

ROGERS, E.M., 1995. Diffusion of Innovations, Fourth Edition. 4 edn. Free Press.

ROGERS, E.M., 2003. Diffusion of innovations/Everett M. Rogers.

ALBOGAST MUSABILA KILANGI: The Determinants of ICT Adoption and Usgae among SMEs: The Case of the Tourism Sector in Tanzania

BØVING, K. B., & BØDKER, K. (2003). Where is the innovation? The adoption of virtual workspaces. Paper presented at the The diffusion and adoption of networked information technologies. IFIP WG 8.6 working conference, Copenhagen.

Dr. GEOFFREY OCEN: Organisational Implementation of ICT: Findings from NGOs in the United Kingdom and Lessons for Developing Countries

MUATHE STEPHEN MAKAU A, et al 2013: An Empirical Study On The Relationship Between Organizational Factors And Adoption Of Ict Among Health Related Smes In Nairobi, Kenya

STEPHEN KYAKULUMBYE, MAURICE OLOBO, VINCENT KISENYI 2012: Information Communication Technology (ICT) Utilization in Private Universities in Uganda: Exploring Strategies to Improve. A Case of Uganda Christian University

NASRIAH ZAKARIA et al, 2010: Managing ICT in healthcare organization: culture, challenges, and issues of technology adoption and implementation

TORNATZKY, L. AND FLEISHER, M. 1990 The process of technology innovation. Lexington, M.A. Lexington Books.

DAVIS, F. D., BAGOZZI, R. P. AND WARSHAW, P. R. (1989) User acceptance of computer technology: a comparison of two theoretical models. Management Science, 35(8), pp.982– 1003.

S. KYAKULUMBYE, M. B. MUHENDA and A. M. NAMANYA, “ICT Utilization in Uganda Local Governments: Why Low Uptake?” LAP Lambert Academy Publishing, Deutshland, 2012.

AJZEN, I. (1991) The theory of planned behaviour. Organizational Behaviour and Human Decision Processes.

AL-GAHTANI, S. S. and KING, M. 1999: Attitudes, satisfaction and usage: factors contributing to each in the acceptance of information technology. Behaviour & Information Technology.

PREMKUMAR, G., K. RAMAMURTHY, and S. NILAKANTA, 1994, Implementation of electronic data interchange: An innovation diffusion perspective, Journal of Management Information Systems

RIGGINS, F. J., C. H. KRIEBEL, and T. MUKHOPADHYAY, 1994, The Growth of Interorganizational Systems in the Presence of Network Externalities, Management Science 40, 984-998.

IACOVOU, C.L., I. BENBASAT, and A.S. Dexter, 1995, Electronic Data Interchange and Small Organizations: Adoption and Impact of Technology,

Hornby, A. S. (2006). Oxford Advanced Learner’s Dictionary.(7th Ed). India, Oxford University press

V. PEANSUPAP AND D. H. WALKER, “Factors Enabling ICT Diffusion and Actual Implementation in Construction Organizations,” 2005

K. AL-GARBI AND S. M. AL-TURKI, “Factors Influencing the Factors of Intranet in Knowledge Management in Developing Organizations,” International Association for Management of Technology (IAMOT), 2001.

SSEWANYANA, J. AND BUSLER, M. (2007). Adoption and usage of ICT in developing countries: Case of Ugandan firms. International Journal of Education and Development using Information and Communication Technology (IJEDICT),

Samuel Attuquayefio, Hilla Addo, Review Of Studies With UTAUT as Conceptual Framework