**Assessing the Usage of e-Government Systems in Zambia:
A Government Employee Perspective**

By

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A dissertation submitted to the University of Zambia in partial fulfilment
of the requirements of the degree of Master of Engineering in Project
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# DECLARATION

I, Grace Mauka-Mukanu declare that this dissertation is solely my own work except as cited in the acknowledgement and that it has not previously been submitted for a higher degree to the University of Zambia or any other institution.

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# CERTIFICATE OF APPROVAL

This dissertation of Grace Mauka Mukanu is approved as fulfilling the requirements for the award of the degree of Master of Engineering in Project Management by the University of Zambia.

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# ABSTRACT

The Government of the Republic of Zambia (GRZ) is transforming the way it interacts and delivers services to citizens, businesses and across government departments and agencies by bringing government closer to the people and making service delivery more friendly, efficient, convenient, transparent, and cost effective through the implementation of e-Government. e-Government is grouped in three distinct classifications; government to government (G2G), government to citizens (G2C), and government to businesses (G2B). Studies have shown that e-Government systems are focusing on dealings with citizens, or systems that interact with G2C. Further, citizens get the widest range of services from e-Government systems. This study focused on G2G of e-Government and further the attention was on the e-Government systems perspective. The study assessed the usage of e-Government systems in the Zambian government, a government employee perspective. Specifically, the study assessed the utilization of e-Government Systems by government employees. The DeLone and McLean model used in this study was modified to create an e-Government Systems Assessment Model. An online questionnaire was distributed to 30 line ministries targeting government employees in Lusaka who use e-Government systems. The findings of the study confirmed that System Quality was the most valued among the quality dimensions. System Quality and Information Quality had a huge impact on User Satisfaction. The study found that Service Quality did not meet User Satisfaction. The study discovered that Use/Intention to Use of the e-Government systems by government employees was moderate. Overall, the respondents were moderately satisfied with e-Government systems. This study has contributed to the body of knowledge by extending the Information Systems (IS) success model for Zambia's civil service use to include a construct Change Management and testing it in the utilisation of e-Government systems. Firstly, the study reveals that Change Management is affected by System Quality, Information Quality and Service Quality. Secondly, Change Management impacts Use/Intention to Use and User Satisfaction. Finally, the study integrated and analysed effects of the quality dimensions on Change Management and effects of Change Management on Use/Intention to Use and User Satisfaction.

**Keywords***: e-Government Systems Assessment Model, Information Quality, Service Quality, System Quality.*

# DEDICATION

To my family.

# ACKNOWLEDGEMENTS

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# ACRONYMS

| | |
|---|---|
| **7NDP** | Seventh National Development Plan |
| **CEEGICT** | Centre of Excellence for e-Government & ICTs |
| **CIO** | Chief Information Officer |
| **CM** | Change Management |
| **CSF** | Critical Success Factor |
| **D&M** | DeLone and McLean |
| **EDI** | Electronic Data Interchange |
| **EGDI** | E-Government Development Index |
| **e-Gov** | e-Government |
| **e-Government** | Electronic Government |
| **ERP** | Enterprise Resource Planning |
| **ESB** | Enterprise Service Bus |
| **G2B** | Government to Businesses |
| **G2C** | Government to Citizens |
| **G2G** | Government to Government |
| **GRZ** | Government Republic of Zambia |
| **GSB** | Government Service Bus |
| **GWAN** | Government Wide Area Network |
| **HRM** | Human Resource Management |
| **ICT4D** | Information and Communications Technology for Development |
| **ICTs** | Information and Communications Technology |
| **IFMIS** | Integrated Financial Management Information System |
| **IQ** | Information Quality |
| **IS** | Information Systems |
| **ISO** | International Organisation for Standards |
| **IT** | Information Technology |
| **M&E** | Monitoring and Evaluation |
| **MPSAs** | Ministries, Provinces Spending Agencies |
| **MS** | Microsoft |
| **PCA** | Principal Component Analysis |
| **PMEC** | Public Management Establishment and Control |
| **QMS** | Quality Management System |
| **SCM** | Supply Chain Management |
| **SDGs** | Sustainable Development Goals |
| **SMS/RSS** | Short Message Service/ Really Simple Syndication |
| **SPSS** | Statistical Package for the Social Sciences. |
| **SQ** | System Quality |

| | |
|---|---|
| **SV** | Service Quality |
| **SZI** | SMART Zambia Institute |
| **TQM** | Total Quality Management |
| **UNZA** | University of Zambia |
| **UN** | United Nations |
| **US** | User Satisfaction |

**CHAPTER 1: INTRODUCTION**

**1.1    Background**

e-Governance is a notion that is increasingly accepted by professionals and researchers in the Information and Communications Technology (ICTs) environment. The world is embracing e-Governance at all levels, which explains its significance and fast-spreading nature (Ashaye, 2014). Some of the benefits of e-Governance include enhancing and increasing efficiency. e-Governance is critical for increasing revenue, promoting competitiveness, and improving marketing in society.

e-Government and ICTs have the potential to ensure that there is sustainable development in all spheres of life. The spread of ICT and global interconnectedness has great potential to accelerate human progress, develop knowledge societies such as scientific and technological innovation among different sectors. The e-Government Survey of the United Nations (2010) reports that transforming the world and realizing the Sustainable Development Goals (SDGs) by 2030 will require a paradigm shift in the way societies govern themselves. It will require rethinking the role of government and the way it interacts with civil society and the private sector in managing the public affairs of a country and responding to the needs of its people (United Nations, 2018).

To ensure accomplishment in the implementation of e-Government initiatives, it is critical to evaluate its performance in the government and public sector. Organisations that have implemented e-Governance successfully develop a tendency of measuring their goals by using procedures that e-Governance provides. Organizations that assess the performance of e-Governance are cautious and guarantee that performance is not just a tracking exercise of items and numbers, but a truly assessment of the actual performance position and enhancement in gains. In order to measure performance, the human aspect is vital. Governments that have implemented e-Governance successfully have found that the particulars of service delivery can be missed on employees if the government does not establish measurable goals.  Formulating clear agendas, placing more expectations about performance and accountability inside government, and building a working team give better results in performance. Creating an open and transparent government is an ideal

index of the effectiveness of gross government activity and progress (Gupta and Jana, 2003).

Governments should distinguish the interaction of e-Governance in its three spheres; Government to Government (G2G) interactions are about the utilisation of technologies to improve the internal efficiency of public administration, through digitizing routine operations and the swift sharing of information amongst departments as well as agencies. Government to Business (G2B) contacts include the utilisation of the internet to lessen the costs of doing business with the government. Government to citizens (G2C) interactions require using the internet to provide services to the public as well as to conduct transactions online and to enhance the delivery of services by integrating swift electronic feedback mechanisms, such as web portals, e-mail and instant polls (National Academy of Sciences, 2019).

ICT has been identified as a substance for socio and economic development thereby promoting competitiveness and to be an enabler of creating good governance in the organisations. However, there are several challenges regarding access to and utilisation of ICTs in Zambia. ICT infrastructure, equally private and public, is inadequate and fragmented, resulting in poor connectivity and communication. Further, the public sector, in particular, lacks adequate human resource in the area of computing and information technology (7NDP, 2017).

The Government of Zambia formed the Centre of Excellence for e-Government and Information Communication and Technology (CEEGICT), an e-Government Division within Cabinet Office in 2015 to coordinate the implementation of the e-Government Programme. The CEEGICT which was later renamed as SMART Zambia Institute (SZI) was mandated to spearhead the coordinated implementation of all the e-Government and ICT Projects that aim to build a service centred, citizen inclusive and development-oriented smart society that use ICTs. The SZI takes particular cognisance of the fact that the transition from the manual traditional delivery of services in Ministries, Provinces, and Spending Agencies (MPSAs) to a fully-fledged provision of online e-Service will require that both ICT Staff and all public service employees undergo responsive change

management and stimulate a correspondingly faster rate of adoption of applications by the majority citizens.

The Government of the Republic of Zambia (GRZ) is transforming the way it interacts and delivers services to citizens, businesses and across government departments and agencies by bringing government closer to the people and making service delivery more friendly, convenient, transparent, efficient and cost-effective through the deployment of e-Government. The services that are delivered electronically are both transactional and informational. User groups of e-Government include citizenry, businesses, and government departments. According to SMART Zambia Master Plan (2018, p.3), e-Government is defined as "the use of Information and Communication Technologies (ICT) in government to provide public services, to improve managerial effectiveness and to promote democratic values; as well as a regulatory framework that facilitates information-intensive initiatives and fosters the knowledge society".

Since the creation of SZI, a number of initiatives have been undertaken within the public sector. So many projects have been implemented such as Integrated Financial Management Information System (IFMIS), Payroll Management and Establishment Control (PMEC) and building of Government-Wide Area Networks (GWAN) among other e-services and systems. Critical applications and services such as IFMIS and shared services such as Outlook, Skype for Business and SharePoint among others are running on the GWAN. Unified internet is transmitted from the Zambia National Data Centre (ZNDC) to the connected institutions. SZI manages the network infrastructure and services on the GWAN platform including the provision of unified internet services.

The purpose of this research was to assess the usage of e-Government systems in Zambia: A government employees' perspective. At present, the majority of research studies and projects are on G2C type e-Government, which focuses on the provision of web based services to citizens. Accordingly, research on G2G e-Government has been minimal. This study examined studies centred on e-Government as well as those exploring G2G. Furthermore, in practice, efforts have been concentrated over the years on building websites and portals to provide services to citizens. According to the United Nations (2010), the predominant focus of global e-Government initiatives had been on G2C, and

this meant that platforms for the delivery of those services were isolated and duplicated. Specifically, the research focused on G2G of e-Government and further the focus was on the e-Government systems perspective. The research examined at Integrated Financial Management Information System (IFMIS) and shared services such as Microsoft Outlook, Skype for Business and SharePoint which are effective communication systems and methods of collaboration of individuals working towards one common goal.

According to Stefanovic *et al.* (2016), deployment of e-Government systems and necessary applications involve acquisition and enhancement of skills from the employees working in the government. Consequently, it is critical to further scrutinize G2G e-Government systems from the public employees' perspective. In order for e-Government programmes to succeed, there is need to make the front office modern and to pay attention in streamlining, re-organising and supporting the back-office processes of public administration that deliver e-Government services to citizens.

## 1.2    Statement of the Problem

The huge investments made by Governments in designing e-Government initiatives make it essential to assess the usage of e-Government systems systemically so that they improve on the value they produce (Sterrenberg, 2017). Despite billions of dollars invested on e-Government programme in Zambia, the degree to which these systems deliver public value varies widely. There has been no report on the assessment of the utilization of e-Government systems in Zambia. The high economic growth has led to an increase in demand for Information and Communication Technology products and services. Despite the increased demand for ICT products and services, the government structures are weak and in many instances, the ICT sections and units are not adequately recognized with many reporting to non ICT departments thereby having no strategic leadership and plans (e-Government Strategic and Implementation Plan, 2013).  Gupta and Jana (2003) reveal that "In order to ensure success in the implementation of e-Government, it is important to assess the performance of e-Government in the government and public sector." Stefanovic *et al.* (2016) state, "Implementation of e-Government systems and appropriate applications require the acquisition of new skills from the government employees. Consequently, it is

critical to further scrutinize G2G e-Government systems from the user and the government employee perspective.

When attempting an e-Governments evaluation of developing countries, more issues emerge, public administration is characterized by inefficiency, limited capacity, poorly trained personnel, a no trust in ICTs added to the immature security of systems and venerability of information to intrusions as well as corruption, and the generally unstable political state. One could say that e-Government was introduced to, in general, help solving administrative problems, nevertheless, because e-Government and its related concepts were developed in and for developed countries, it should not be assumed that it will be appropriate for developing countries (Idoughi and Abdelhakim, 2018).

Iivari Juhan, (2005) reports that the total annual worldwide expenditure on ICTs probably exceeds one trillion US dollars per year and is growing at about 10% annually. At the same time, information systems are pervading almost all aspects of human life. In view of the high investments in ICTs and its ubiquity, the success of such investments and the quality of the systems developed are of the utmost importance both for research and in practice.

Idoughi and Abdelhakim (2018) report that Governments across the world have started their own e-Government initiatives after they understood that it is a viable tool to help deliver efficient and cost-effective services to citizenry, clients and partners. Still, such projects require large amounts of funding and pose heavy economical burdens especially in the case developing and low-income countries, yet because of hast and the leak of appropriate assessment frameworks Heeks, (2008) says about 20% to 25% of developed countries' projects were either never implemented or abandoned just after implementation, further 33% partially failed. As for developing countries, as many as 35% of their e-Government projects were classified as total failures while 50% as partial failures. Thus, in order to ensure e-Government success, it is essential to assess its success and effectiveness and take necessary measures (Gupta and Jana, 2003).

The annual worldwide spending on ICTs has been increasing for many years. By 2010, International Data Cooperation expects the total expenditure on IT to reach 1.48 trillion US dollars IDC (2007) in Urbach *et al.* (2011). Simultaneously, however, a greater number

of information systems (IS) failures are still emerging. A questionnaire-based survey carried out at US financial institutions and various companies in the northeastern USA in 2006 indicated that only 62% of software projects were considered successful Verner, Cox and Bleistein (2006) in Urbach *et al.* (2011). The measurement of investments and developed systems' success remains a top concern for both practitioners and researchers due to the high investments, the number of IS failures and the paradox of high investments and low productivity returns productivity paradox (Urbach *et al.*, 2011).

Therefore, the statement of a problem is based on the 7NDP (2017) which reports that there are challenges regarding the utilisation of ICT in Zambia, in particular, the public sector lacks adequate human resource in the area of computing and information technology. This has been compounded by a weak supportive legal and institutional framework for the development and utilisation of ICT. Empirical evidence of Zambia's performance in the utilisation of ICT as evidenced in indices produced by various international organisations is poor. Under 7NDP, the focus is to increase investments in ICT infrastructure and human resource development. Further, the Government will undertake policy, legal and institutional reforms to facilitate universal access to ICT and promote the use of ICT in businesses; networking of services and applications across the public sector and online access to government services will be prioritised.

## 1.3 Main Objective

The main objective of this study was to assess the utilization of e-Government Systems by government employees.

## 1.4 Specific Objectives

To achieve the main objective, the specific objectives of the research were:

1) measure the performance of the e-Government systems regarding System and Information Quality;
2) assess the service quality from information system providers and measure the readiness of personnel in the use of e-Government systems;

3) assess the behaviours and attitude of users' dependency on e-Government systems;

4) evaluate the government employees' satisfaction with the e-Government systems.

## 1.5 Research Questions of the Study

The specific objectives were accomplished from the following questions:

1) How do the e-Government systems perform in terms of systems quality and information quality?

2) How ready are the government employees in the utilisation of e-Government systems?

3) How are the behaviours and attitudes of users on the dependency of the e-Government system and frequency of system use?

4) What general satisfaction do government employees have with e-Government systems?

5) What contributions do e-Government systems have towards the success of individual employees?

## 1.6 Significance of the Study

The Government of the Republic of Zambia (GRZ) is transforming the way it interacts and delivers services to citizens, businesses and across government departments and agencies by bringing government closer to the people and making service delivery more user-friendly, efficient, transparent, convenient, and reduction of costs in doing business through the implementation of e-Governance. Governments throughout the world have deployed e-Government projects that aimed at delivering electronic services and information to citizens, businesses and governments departments. e-Government projects usually consume huge amounts of financial resources.

It is vital to assess the usage of e-Government systems. Such assessment attempts could enable government institutions to determine whether they can do the required task and delivering services as expected. The successful implementation of e-Government could further raise the efficiency and quality of government supervision of markets, management

of public service, improve the transparency and fairness, and promote the transformation of government functions (SMART Zambia Master Plan, 2018).

There are three kinds of situations that require evaluation in e-Government. One is the e-environment; second is evaluating the performance of an e-Government programme or project; and third is the overall impact of e-Government on general government functioning, economic development and citizen servicing (Gupta and Bhattacharya, 2007).

In spite of the benefits of this information system to the government employees, measuring its overall success will depend largely on employees' satisfaction. Measurement of the utilisation of e-Government systems in Zambia can only be achieved through feedback from users. The feedback will act as a signal and a scale for stakeholders to justify their investment in the systems and appraise their effort in the systems developments and procurements. This vital feedback can only be achieved through a survey of the e-Government systems IS users to discover their candid view of the systems.

## 1.7    Study Sites/Delimitation

This study focused on assessing the usage of e-Government systems, a perspective of government employees within Lusaka. Further, the concentration was on the e-Government systems point of view, such as Integrated Financial Management Information System (IFMIS) and shared services like Ms Outlook, Skype for Business and SharePoint which are effective communication systems and methods of the collaboration of individuals working towards one common goal.

## 1.8    Operational Definitions

**e-Government** - United Nations (2010); Use of computers and networks to improve the personal productivity of government workers, and changes to more efficient business processes associated with a transition to electronic government services.

**e-Government Systems –** Systems and services offered by information systems providers.

**Assessment –**used interchangeably with evaluation

**Evaluation -** used interchangeably with assessment

**Shared Services** – Government e-mail Microsoft Outlook, Skype for Business, SharePoint

**System** - a collection of elements or components that are organized for a common purpose

**IFMIS** – Integrated Financial Management Information System (IFMIS)

**Information Systems** - are interconnected components in collaboration to collect, process, store, and publish information to support decision making, coordination, control, analysis, and visualization in an organization.

**Usability** – Level at which e-Government systems provide desired results

**Output** – information produced by e-Government Systems

**Service Quality** – quality of service that users of an e-Government system receive from information systems providers.

**System Quality** – performance of an e-Government system in terms of usability.

**Information Quality** – This is the quality of e-Government system output

**Use/Intention to Use –** It is a degree and way in which employees utilize the capabilities of an e-Government system. It is the attitude users have towards an e-Government system.

**User Satisfaction (US)** – It is a general idea and attitude users have about the e-Government system.

**Change Management –** services offered to e-Government system users such as service awareness, training and coaching

**Democratic Information –** provision of information such as age, designation, institutors and years of work experience.

## 1.9    Summary Research Methodology

Research methodologies are systematic processes for solving a research problem. They include research design, study population, study sample description, sampling technics,

instruments used in data collection, methods of data processing and analysis (Dawson, 2007). The research was designed to be conducted as follows:

### 1.9.1 Literature Review

**a)    Secondary Data**

Literature review prepares a research methodology suitable for the research, it uncovers theories and concepts and addresses the topic of study, knowledge gap, research problem, objectives and questions (Kumar, 2011). Literature review offered justification for the research topic 'Assessing the Usage of e-Government Systems in Zambia; a Government Employee Perspective', provided the basis for comparison and contrast of ideas among already researched work, it also reviewed other researchers work so as to refine ideas for use in the research study.

Document analysis schedule involved reading the existing literature such as journals, magazines, books and other written materials. Document analysis schedule assisted in interpreting and discussing the data in the study.

**b)    Primary Data**

Kumar (2011) defines research design as a set of methods and procedures used in collecting and analyzing measures of the variables specified in the problem research. Frameworks that were created to find answers to research questions were qualitative and quantitative methods. A qualitative approach based on interviewing candidates was carried out. For the quantitative approach, a questionnaire was handed to the participants, to get feedback about the utilisation of the e-Government systems in Zambia. Therefore, structured interviews were conducted, and a questionnaire was designed and emailed to the targeted respondents for data collection.

*Questionnaire*

The questionnaire was distributed online a Google Drive application. The respondents that were of interest were identified government employees in Lusaka who use e-Government systems.  The advantage of using Google Drive application was that it shortened the data

collection process. Data was captured directly into excel sheet online. The captured data was to help assess the utilisation of e-Government systems.

*Interviews*

The target group for the semi-structured interviews were five (5) people from SMART Zambia and ten (10) from the line ministries. However only seven (7) people were interviewed, each from a different ministry and five (5) from SZI to bring a total number of interviewees to twelve (12). The interviewees were drawn from the following ministries; Ministry of Commerce and Industries, Ministry of Finance, Cabinet Office, Office of the Auditor-General, Office of the Vice President, Ministry of Local Government and Ministry of Lands. The respondents were drawn from junior, middle and senior levels of management.

## 1.9.2   Data Analysis and Recommendation

The sample size was 120 candidates, an online questionnaire was sent to 120 email addresses from which only 90 fully answered the questionnaire. The data analysis was based on the 90 respondents. Further analysis of the collected data was done through a statistical package SPSS and excel. After the analysis on the collected data was made, the study drew conclusions on the utilisation of e-Government systems by government workers in Lusaka. Based on the data analysis and findings, recommendations were made on the usage of e-Government systems.

## 1.10   Structure of Dissertation

The report is organized in five (5) chapters as follows:

Chapter 1 is an introduction which presents the area of study and its background which leads to the definition of a research problem and the formulation of the objectives and research questions. A brief summary of a research methodology is presented.

Chapter 2 is a literature review where a presentation of the definitions of e-Government from a different perspective was done. A review of various literature on assessing the usage

of e-Government systems was conducted, the essence was to adopt a rightful model to use in the context of a research topic.

Chapter 3 is a research methodology which discusses methods and research designs used. It also highlights the sampling frame, sample size and sampling methods that were used. Furthermore, the chapter deals with data collection instruments and methods of administering data collection instruments as well as analysis techniques.

Chapter 4 is data analysis, findings and discussions which reviews a method of presenting data using the objectives as well as the corresponding research questions.

Chapter 5 is conclusions and recommendations, this chapter gives an overview of the study, provides a conclusion drawn from the findings and recommendations based on a conclusion. It also states the limitations of the study.

## 1.11    Summary

This chapter introduces the topic studied and a brief overview of e-Governance. A background to the research and problem statement was presented in this chapter. Significance of the study was portrayed as well as a description of a brief research methodology. The structure of the dissertation was also presented. The following chapter is a literature review whose purpose was to learn about what other researchers had studied before or done on assessing the usage eGovernment Systems.

**CHAPTER 2: LITERATURE REVIEW**

## 2.1    Introduction

Chapter one introduced concepts and broad issues covered in the study. It presented an overview of e-Government and the importance of assessing the performance of e-Government in the government and public sector. Chapter two presents the literature review and explains the concept and characteristics of e-Government. The aim of this chapter was to review various literature from researchers in line with assessing the usage of e-Government systems from a government employee perspective. The essence was to adopt a rightful model to use in the context of a research topic of this study. There are three broad classifications of e-Government: G2G, G2C, and G2B. This study focused on G2G type of e-Government.

The approach taken to review literature was as follows:  section (1) is an introduction to literature review on assessing the usage of e-Government systems; section (2) discussed e-Governance, the study reviewed the background of e-Government and its definitions from a different perspective. Forms of e-Government, potential benefits e-Governments brings to organisations and barriers of e-Government implementation. Further, the study discussed the status of e-Government in Zambia; section (3) reviewed the literature on G2G type of e-Government; section (4) reviewed the literature on the status of e-Government systems from various countries; section (5) analysed various e-Government assessment frameworks to find a suitable model for the study; section (6) described change management and its importance in the utilization of e-Government system, and finally, section (7) discussed a research framework to assess the usage of e-Government systems in Zambia; a government employee perspective, thereafter a conceptual model for the study was created.

## 2.2    e-Government

### 2.2.1   The Background of e-Government

The use of ICT in governments initially expanded during the 1950s and 1960s. However, e-Government emerged as an agenda for a general reform of the public sectors of liberal democratic political systems during the early 1990s. The administration of President Bill

Clinton led the way with the 1993 National Performance Review (NPR) of the federal bureaucracy. The massive use of the internet in the mid-1990s brought motivation to the concept. Nations such as Canada, the United Kingdom, New Zealand and Australia soon followed through their styles. In the United Kingdom the Labour Party, elected in 1997, put electronic service delivery at the centre of its program of modernizing government (National Academy of Sciences, 2019).

### i. Development of Information Technology Management at the National Level

The governments in the 1990s started using Information Technology (IT) to automate their operations in their offices but did very little on the automation of service delivery and information dissemination. Governments strategic focus echoed a mainframe processing approach that had led the national strategy and IT policy in the 1960s. Beginning late 1990s, considerations started shifting from simply operations in the backroom. The national Chief Information Officers (CIO) began stressing IT projects that suggested: "services to the citizen." During the same period, the administration of President Bill Clinton was performing the NPR, also known as Re-engineering Government. NPR placed solid accentuation on IT-supported government. Re-engineering through IT in February 1997 was one of the first instances on which the United States of America government commenced adopting what is now referred to as electronic government (National Academy of Sciences, 2019).

### ii. Objective of e-Government

A discrepancy must be applied between the objectives for internal processes and for objectives focused on external services. External objectives of e-Government are to satisfy the needs and expectations of the public thus satisfactory on the front-office side. This is done by streamlining the interaction with several online services. The utilisation of ICT in government operations enables transparent, speedy, accountable, efficient and effective interaction with the public, businesses and citizens and other organizations. At the back office, the interior objective of e-Government in government operations is to enable a transparent, speedy, accountable, efficient and effective process for functioning government activities. The outcome of this intervention could be significant cost savings in doing business within the government. Deployment of ICT projects, mostly huge

projects which may have a major effect on service quality enhancement or efficiencies, may raise various issues, a considerable lot of which relate mostly to operating within government (Basu, 2004).

### 2.2.2 Definition of e-Government

There are numerous definitions of e-Government currently in use worldwide and a selection of these was presented below. While differing in emphasis, most of these definitions focus on the use of ICT to improve the delivery of government services.

The ICT Policy (2006) states that e-Government involves the implementation and exploitation of ICTs to facilitate the process of bringing Government closer to the people through major improvements in the delivery of goods and services as well as information provision in ways that are most convenient to citizens and other stakeholders. The purpose of transforming Government through ICTs is to realise efficiency gains, reduce operational and administrative costs as well as streamline government processes and procedures.

National Academy of Sciences, (2019) defines e-Government as the application of the Internet and other IT to provide governmental information and services electronically. It offers the potential of increased convenience to the public by making such services available 24 hours a day, 7 days a week, coupled with the advantages of improved accuracy and also reduced cost to the government, deriving from its requiring little or no direct interaction with a government employee

The World Bank (2011), defines e-Government as the use by government agencies, information technologies that have the ability to transform relations with citizens, businesses and other arms of government. These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth and cost reductions.

According to UNECA (2014), e-Government potentially enhances the social and economic development of countries by enabling improved access to government services. Examples

range from better access to information on available services to complete online processing of requests for permits, certificates, payments, among others. Effective use of e-Government can also improve the efficiency and effectiveness of the public sector and linkages between government agencies.

Other definitions of e-Government found in the literature included the one by Dias (2005) who quotes the Gartner Group a Computer Science institution, which defines e-Government as the transformation of internal and external public sector relationships through the Internet and ICTs with the aim of optimizing government services delivery, citizens participation, and government processes.

Almarabeh and Abuali (2010), state that for one to understand the idea of e-Government, they must first understand government in general. Government is actually a dynamic mixture of goals, structures and functions. Basu (2004), reports that e-Government is more than a website, email or processing transactions via the internet. e-Government becomes a natural extension of the technological revolution that has accompanied the knowledge society. e-Government added new concepts such as transparency, accountability, citizen participation in the evaluation of government performance.

There are a lot of definitions of e-Government midst specialists and researchers. However, most of them agree to define e-Government as use of ICTs by the government to offer citizens, businesses and government agencies the opportunity to interact and do business with government by using different electronic media. e-Government is about how government organizes itself thus its guidelines and policies, administration, regulations and frameworks set out to complete service delivery and to co-ordinate, integrate processes and collaborate within itself.

Generally, of all the existing definitions from various sources, there are a lot of things that are in common. The principle centre of the definitions above is in light with the way e-Government should enhance service delivery thus create an enhanced business with the government to citizens and government to government agencies through the help of ICTs, specifically the internet.

### 2.2.3   Forms of e-Government

While e-Government embraces different activities and actors, the literature points out three different forms of e-Government thus government, citizens and businesses. The acronyms G2C – means the relationship between government and citizens or customers; G2G – is the relationship between government and other government agents; and G2B – is the relationship between government and businesses or companies (Heeks, 2008). These forms have their own objectives, though they share some goals, for instance, ensuring more reliability and efficiency. The sections that follow describe further the different segments of e-Government as reported by Heeks (2008).

**a)      Government to Government (G2G)**

e-Government initiatives within this segment deal specifically with improving the interior workings of the public sector. They involve:

i.   *Cutting process cost* - this is improving the input and output ratio by cutting financial and time costs;

ii.  *Managing process performance* - this is planning, monitoring and controlling the performance of process resources such as financial and human resources and many more;

iii. *Making strategic connections in government* - this is linking agency levels, other arms of government and data stores of the government to strengthen capacity to probe, develop and implement strategies and policies that guide government processes; and

iv.  *Creating empowerment* **-** this is transferring authority, power and resources for processes from their current places to new locations.

**b)       Government to Citizens (G2C)**

Activities such as G2C deal chiefly in liaison between government and citizens. The relationship between the government and citizens could either be as voters or stakeholders of which the public sector could spring up to its legality or as customers who use public services. These initiatives may possibly incorporate perfectly the process improvements. They include:

i. ***Talking to citizens*** - this is offering citizens with aspects of public sector activities. Mainly, this relates to specific accountability such as ensuring that public servants are more accountable for their actions and decisions;

ii. ***Listening to citizens*** - this is increasing the involvement of citizens into public sector decisions and actions; and

iii. ***Improving public services*** **-** this is improving service delivery to members of the public with elements such as quality, convenience and cost-efficient.

## c) Government to Businesses (G2B)

Activities such as G2B deal mostly with the interaction between public agencies and other institutions such as other public agencies, private sector companies, non-profit and non-governmental organisations. As with citizen interactions, these activities could incorporate well the process improvements identified above in G2G section, they include:

i. ***Working better with business*** **-** this is improving the interaction between government and businesses. This involves digitising regulations, procurements and services to ensure that businesses improve quality, convenience, efficiency and cost-effective;

ii. ***Developing communities*** - this is building the economic and social capacities as well as the capital of local communities; and

iii. ***Building partnerships*** - this is creating organisational consortiums to achieve economic and social objectives. The public sector is practically always one of the partners, though sometimes it acts only as a facilitator for others.

### 2.2.4   Potential benefits of e-Government

The Government of Zambia is aware that the potential benefits that are derived from the deployment of e-Government are immense. However, Government is also aware that mere deployment of ICTs in the public sector will not necessarily translate into improvements in service delivery unless appropriate institutional reforms to address the challenges that could hinder or undermine the process of effective implementation of ICTs are addressed (ICT Policy, 2006).

ICTs and e-Government aim at ensuring that nobody lags behind in sustainable development. The spread of ICT and worldwide interlinkages have potential to step up human progress, link the digital divide, build knowledge societies such as technological innovation and science among different sectors (United Nations, 2018).

e-Government can facilitate better collaboration within the entire public sector and society, triggering socially sustainable and appropriate solutions to difficult social issues. Key to adjusting the unavoidable techno-cultural transformation is the formation of a safety network. There is a necessity for a better sense of balance between short-term economic gain and ground-breaking research by the universities of science and technology that handle grand societal challenges. In attaining public resilience, gaining access to high-speed internet is critical. Everybody should be involved in the digital economy (United Nations, 2018).

### 2.2.5 Barriers of e-Government Implementation

Ashaye (2014) states that e-Government is known to face challenges in its implementation. This is due to inadequate personnel and expertise required for successful development. Almarabeh and Abuali (2010) identified some of the barriers that come about in the implementation of e-Government as follows;

  i.    Lack of technology or web staff,
  ii.   Lack of financial resources,
  iii.  ICT infrastructure such as e-Readiness, computer literacy, telecommunication equipment,
  iv.   Issues regarding security,
  v.    The need to upgrade existing IT,
  vi.   Policy issues such as Legislation,
  vii.  Human capital development and lifelong learning such as skills, capabilities, education, and learning,
  viii. Change management such as culture, resistance to change, training and sponsorship,
  ix.   Partnership and collaboration such as public and private partnership, community, and network creation,
  x.    Strategies such as vision and mission statement, and
  xi.   Leadership role such as motive, involvement, influence, and support.

Availability and accessibility are two important requirements that are needed to contribute to successful e-Government transactions all through every single day. This provides citizens, partners, and government employees with the flexibility to process transactions outside standard government office hours. An e-Government website needs to satisfy the intended users this "high availability" requirement. Further, e-Government is critically dependent on the accessibility of its fundamental websites. If the website is not accessible to the intended target users it will not be successful (Almarabeh and Abuali, 2010).

### 2.2.6 Existing Policies on Information Systems

### a) The Seventh National Development Plan

The goal of the Seventh National Development Plan (7NDP) is to create a diversified and resilient economy for sustained growth and socio-economic transformation driven, among others, by agriculture, tourism, manufacturing and mining. Furthermore, this Plan responds to the Smart Zambia transformation agenda 2064 and embeds in it the economic stabilisation and growth necessary for the actualisation of a Smart Zambia. This is in support of the UN 2030 (7NDP, 2017).

Information and communication technology (ICT) has been identified as a catalyst for socio-economic development by promoting competitiveness as well as being an enabler of good governance. However, there are several challenges regarding access to and utilisation of ICT in Zambia. ICT infrastructure, both public and private, is inadequate and fragmented, resulting in poor connectivity and communication. Further, the public sector, in particular, lacks adequate human resource in the area of computing and information technology. This has been compounded by a weak supportive legal and institutional framework for the development and utilisation of ICT. Empirical evidence of Zambia's performance in the utilisation of ICT can be found in indices produced by various international organisations (7NDP, 2017).

Under 7NDP, the focus will, therefore, be to increase investments in ICT infrastructure and human resource development. Further, the Government will undertake policy, legal and institutional reforms to facilitate universal access to ICT and promote the use of ICT in businesses; networking of services and applications across the public sector and online

access to government services will be prioritised. The mainstreaming of ICT in the education curriculum will be accelerated to ensure increased uptake and utilisation of ICT to reduce government service delivery costs (7NDP, 2017).

The Government will put in place appropriate laws, policies and regulations to support the provision of electronic services and to promote private sector/citizen confidence and participation. To improve ICT infrastructure, there is a need to invest in and upgrade telecommunications networks, data centres and access devices through the SMART Zambia Master Plan. This will improve the flow of information within and among government institutions, enterprises and citizens to bring about social and economic benefits. The Government will transform its mode of delivery of public services from traditional face-to-face interaction to online channels to ensure that citizens and business entities can access services anywhere and anytime. The Government will also facilitate ICT skills up-scaling for public service workers and the private sector. To ensure sustainable development and utilisation, the Government will accelerate the mainstreaming of ICT in the Zambia education curricula (7NDP, 2017).

### b) The National Information and Communication Technology Policy ICT Policy (2006)

The gap between the rich and poor nations and between certain groups within a country is a result of several factors. One such factor in inequitable access to resources among the citizenry and lack of technology to exploit the vast natural resources available in most countries. One fundamental difference between the developed and the developing countries is that the former is also rich in information and has a well-informed citizenry which is able to adapt quickly to changing social and economic environments, hence utilizing opportunities to overcome development challenges such as poverty. In this regard, information is treated as a commodity which has the potential to make significant changes in many aspects of our social and economic development (ICT Policy, 2006).

ICTs can be used to bridge the digital divide within the context of globalization. The digital divide presents barriers by denying an opportunity for the people to take best practices and make them applicable in possible ways. Zambia has the opportunity to make a difference

by adopting and using ICT as a tool available to reduce the development divide thereby increasing the chances of improving the quality of life of the citizens. ICT is an enabler to build an information centred society where everyone can create, access, utilize and share information and knowledge leading to greater productivity, greater competitiveness and sustainable economic growth, a precondition for poverty reduction (ICT Policy, 2006).

The Zambian economy has experienced a decline since the 1980s due to several factors among them the low productivity in the mining, manufacturing and agricultural sectors. The net effect has been increased poverty levels now estimated at over 70 per cent of the population living with less than US$1 per day. To address the economic quagmire Government liberalized the economy in 1991. This new economic path can be, in part made possible by advances in information and communications technology, which can reduce the cost of and increase the speed of communicating in the country hence abolishing barriers of time and space. ICT has also made possible the integration of national systems of production and finance. Further, ICTs are driving significant changes in both micro and national levels by; increasing effectiveness and reach of development interventions, by enhancing good governance and lowering the cost of the delivery of basic social services. In the sphere of education for example, ICTs have the potential to improve the quality of education and training through e-learning and online learning (ICT Policy, 2006).

### c) Smart Zambia Master Plan

The Zambian Government has been implementing e-Government for over 5 years. e-Government has been acknowledged and embraced globally as one of the most efficient drivers for transparent, appropriate and inclusive decision making. The Zambian government has deployed a good number of systems which are currently operational. In order to improve the implementation of e-Government, the Zambia government launched the SMART Zambia agenda in September 2015. The goal of the SMART Zambia agenda is to attain economic and social change by embracing an outlook change from traditional approaches of delivering services. The outlook change requires leveraging ICTs to streamline and improve service delivery systems, create a favourable condition for investing in businesses, and improve the wellbeing of Zambians (SMART Zambia Master Plan, 2018).

The SMART Zambia agenda necessitated the development of the SMART Zambia e-Government Master Plan (2018-2030). The vision of the Master Plan is to achieve transformation of GRZ into an information and knowledge-based society and economy supported by consistent development of, and pervasive access to ICTs by all citizens by 2030. The e-Government Master plan is a map for coordination and integration of ICTs. The alignment of the e-Government Master plan to the National Vision and the 7NDP provided an opportunity to improve resources as well as speed up the development and deployment of infrastructure and services. The Plan facilitates the Zambian government by guiding the deployment of ICT projects as opposed to silo investments (SMART Zambia Master Plan, 2018).

Recently, the government made huge investments in ensuring that the required ICT infrastructure is positioned. The infrastructure has been installed already including the establishment of the National Data Centre and National Broadband Network under the Smart Zambia project Phase One and Two. Further, online and electronic platforms are implemented for selected public services such as tax processing, patents and companies' registration, and immigration visa application and processes, among others. In addition, Government has implemented a government-wide-area- network (GWAN) and enterprise agreements to improve efficiency in its operations (SMART Zambia Master Plan, 2018).

Currently, the Government through SMART Zambia Institute is in the process of implementing Government Service Bus (GSB). This is basically an implementation of a unified information exchange platform for the sharing of resources, and establishing e-Government information resource catalogue and exchange system to meet the government in population management, investment, trade processes, social security, and other areas related to government business economy, people's livelihood and social management, to provide basic data demands. The GSB will integrate systems such as electronic payment systems for public services with a view to an increasing collection of non-tax revenue and minimizing leakages. Other systems which will be integrated into GSB and are in the process of being deployed are government portal and a single-window portal for accessing and delivering selected government services digitally. Government Portal is an integrated electronic platform that will enable Zambians to access Government services and

information online from any location, at any time with ease. This will contribute to reducing the cost of doing business and eliminating corruption by reducing human contact.

**d) The e-Government Strategic and Implementation Plan**

This e-Government Strategic Plan originates from the Government's Vision 2030 and the National Information and Communication Technology (ICT) Policy. In line with the Vision 2030, Zambia aspires to be technologically proficient, fully able to adapt, innovate and invest using its human and natural resources. This will be done through improved access to information in order to promote citizenry participation in social-economic development.

With regards to the ICT Policy, it's premised on three thematic areas namely: capacity building; a competitive and efficient ICT sector; and an effective legal and regulatory framework. Further, the three thematic areas are broken down into thirteen pillars. The thirteen pillars form the basis for the implementation of the national ICT Policy, of which e-Government is one of them. The e-Government Strategic Plan attempts to highlight how e-Government services will be delivered to citizens (G2C), businesses (G2B), Government functionaries (G2G) and Government Employees (G2E). The services in the portfolio need to be prioritized taking into account those initiatives that provide most value while generating cost savings or improving the effectiveness of government. The Strategic Plan serves as the principal working document for management to meet the present and future needs of government services through short and long-term plans (e-Government Strategic and Implementation Plan, 2013).

The focus of the e-Government project will be on improving coordination and implementation of e-Government systems at national, provincial and district levels. The Cabinet Office e-Government secretariat will ensure that the implementation Plan and M&E Framework is adhered to by the various implementing institutions, including the reporting requirements. There will be a need for an appropriate Policy and Legal Framework to support the implementation (e-Government Strategic and Implementation Plan, 2013).

### e) United Nations e-Government Survey Report

UN e-Government Survey Report classifies the countries in 4 different groups: Very High e-Government Development Index (EGDI), that is, (Greater than 0.75), High EGDI (Between 0.50 and 0.75), Middle EGDI (Between 0.25 to 0.50) and Low EGDI (Less than 0.25). Currently, Zambia is categorized as a Middle EGDI, (0.25 to 0.50). A 2018's e-Government Readiness Index shows Zambia occupying 133rd position out of 193 countries surveyed with an e-readiness Index of 0.41 (United Nations, 2018). Zambia improved from 2008 where it ranked number 154th out of 182 countries with an e-readiness Index of 0.02. It is known that in 2005, the country's government literally had no online presence (United Nations, 2018). Figure 2.1 shows the EGDI ranking for Zambia against an EGDI world leader and an EGDI regional leader.
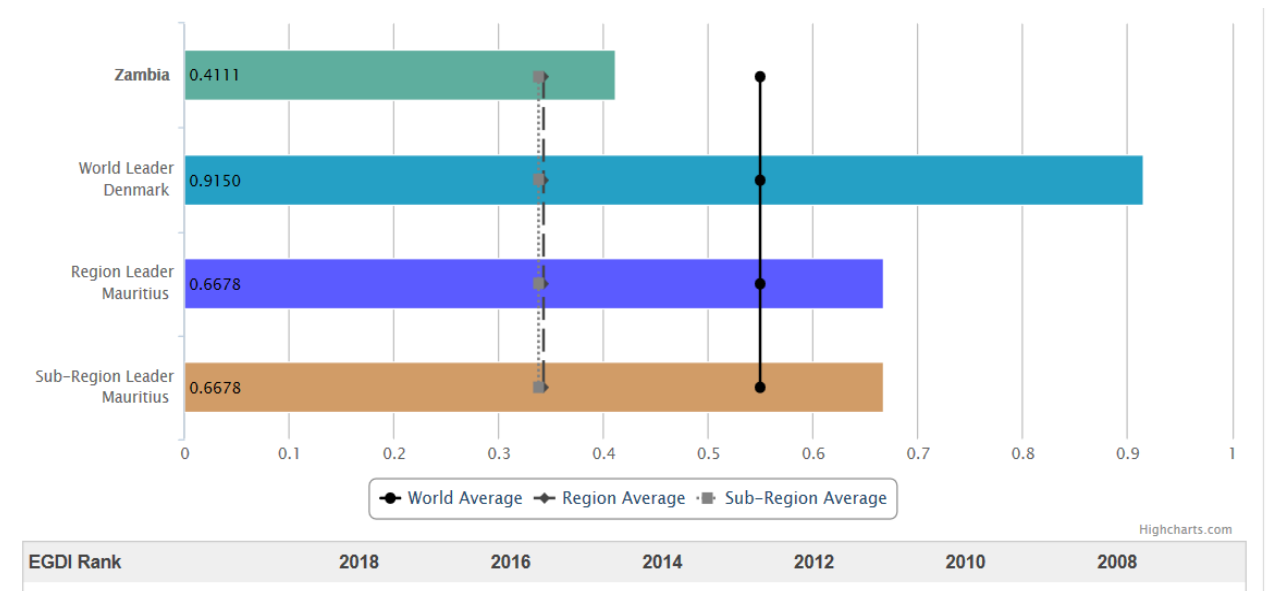


*Figure 2.1:  e-Government Development Index*

Figure 2.2: *e-Participation* depicts the e-Participation ranking for Zambia against an e-Participation world leader and an e-Participation regional leader.

| EPART Rank | 2018 | 2016 | 2014 | 2012 | 2010 | 2008 |
|------------|------|------|------|------|------|------|
| Zambia     | 132  | 118  | 143  | 134  | 180  | 170  |
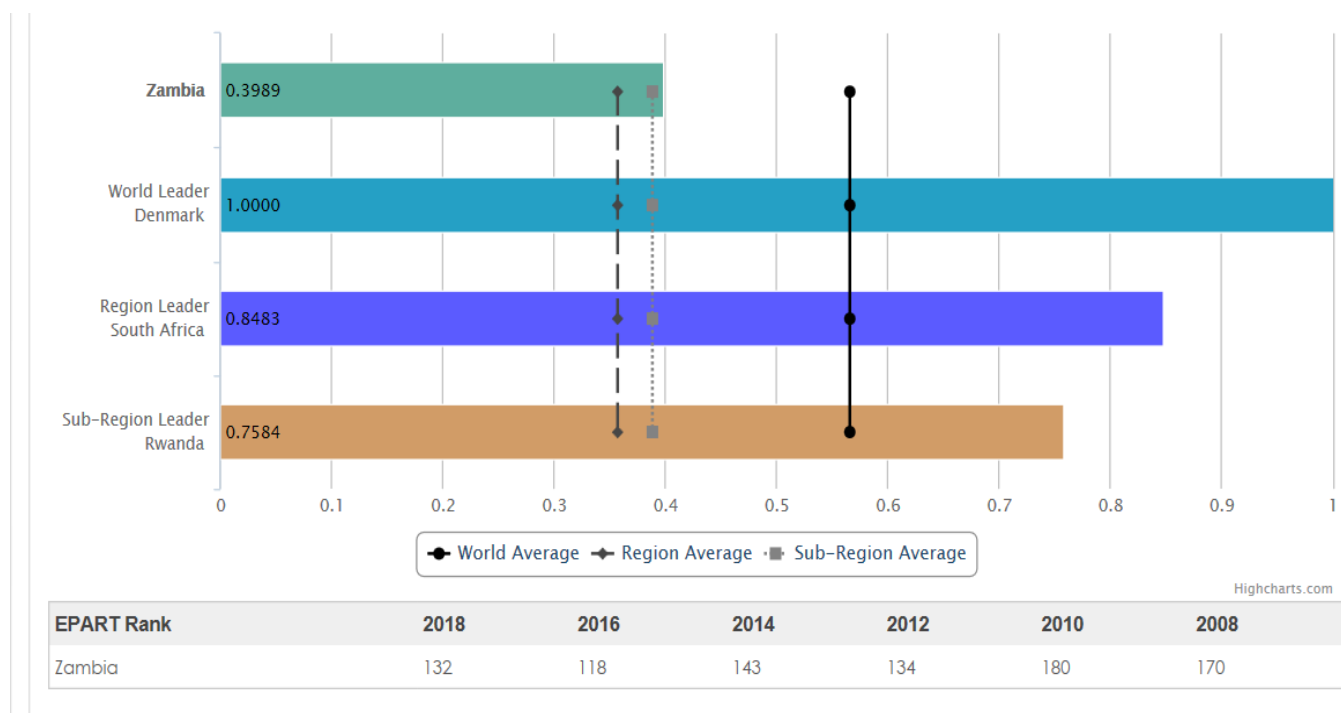
*Figure 2.2:  e-Participation*

According to the United Nations (p.84, 2018) "e-Government has been growing rapidly over the past 17 years since the first attempt of the United Nations to benchmark the state of e-Government in 2001. The 2018 Survey shows a persistent positive global trend towards higher levels of e-Government development. In 2018 edition, 40 countries scored "Very-High", with e-Government Development Index (EGDI) values in the range of 0.75 to 1.00, as compared to only 10 countries in 2003, and 29 countries in 2016. Since 2014, all 193 Member States have been delivering some form of an online presence." Figure.2.3*:       EGDI Percentages of the different groupings* shows the percentages of the different groupings based on EGDI in 2018 compared to 2016.
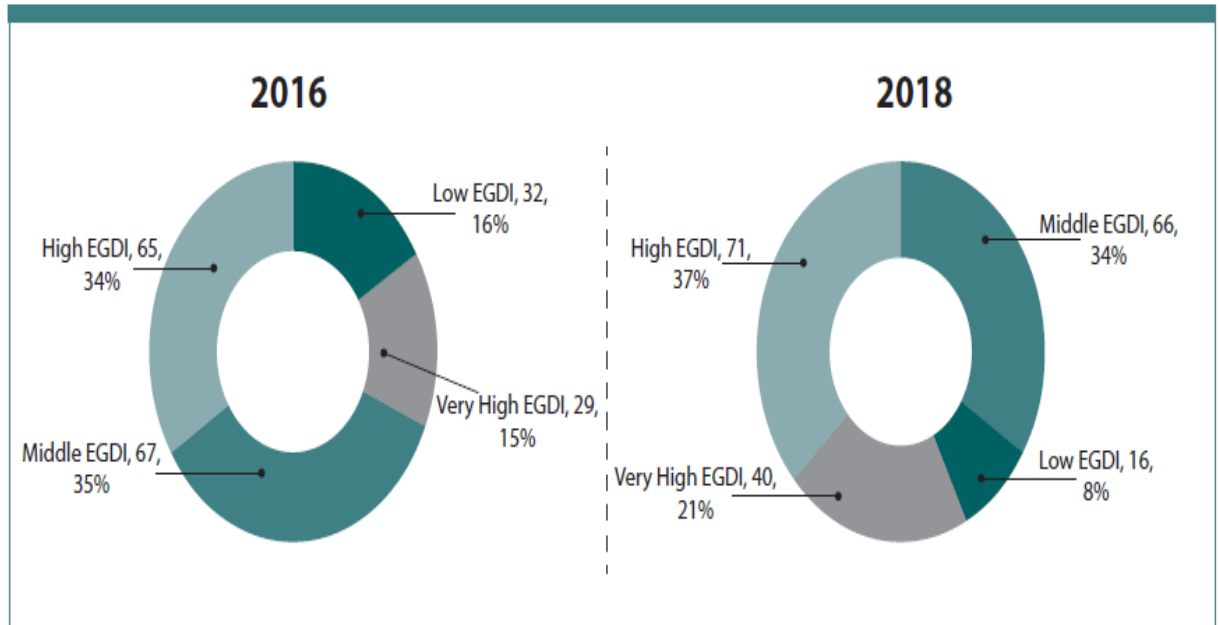
*Figure.2.3:  EGDI Percentages of the different groupings*

Countries in all regions of the world are continuing to make strides in their efforts to improve e-Government and to provide public services online according to a 2018 new report launched by the United Nations Department of Economic and Social Affairs. Over recent years, the presence of online government services has become increasingly common. In 2018, Denmark was ranked first with a near-perfect E-Government Development Index (EGDI) rating of 0.9150. The EGDI assesses e-Government development at a national level and is based on three components: online service index, telecommunication infrastructure index and the human capital index (United Nations, 2018).

## 2.3    Government to Government

Government to Government (G2G) is a relationship between two government institutions. A successful G2G has the essential resources for collaboration and communication between government institutions aiming at serving citizens better. Consequently, G2G enhances and develops collaboration and cooperation between government institutions. Communication between government institutions relies on the collaboration and cooperation processes that they put in place (Hamza *et al.*, 2011).

In the past twenty years, there has been a growth in governments globally to provide electronic access to the services they offer through ICT. Especially with the introduction of the Internet, governments worldwide have been endeavouring in making their processes more effective and efficient. Besides the effort to provide citizens with electronic access, governments have made attempts to enhance their inner processes as well. The utilisation of ICT is habitually considered as a key to transformations in the public sector by enhancing the efficiency of government processes, bringing transparency in government operations, and offering improved and more effective services to businesses and citizens of the nation (Nnorom and Osibanjo, 2008).

e-Government has gone through four phases; information, interaction, transaction, and the integration phase. The integration phase is a lot more than the government owning a web presence. Moreover, government institutions work together with one another to provide the services, share information, and integrate their functions. Hence, a number of government institutions can be engaged in delivering each service at a single passage point. Subsequently, e-Government success depends on relationships between the different government agencies that must harmonize their activities to serve citizens better. These interactions are referred to as Government to Government (G2G) (Hamza *et al.*, 2011).

### 2.3.1 ICT and Organizational Factors

According to Hamza *et al.* (2011), successful G2G needs executing more reasonable management and collaboration policies, a lot more dependable strategies, and sustainable investments. Previous studies have shown that G2G has gone through two phases of development thus catalogue access and transaction capability. Catalogue access gives government institutions with information sharing infrastructure such as intranets. Transaction capability gives government institutions ways of exchanging data and manage transactions in real-time. Some studies have discovered the factors that impact G2G relationships. These factors are mostly related either to ICTs or to organizational components. Several studies focus only on ICT factors whilst others on organizational aspects, and yet others on both.

### 2.3.2 Government Employee Satisfaction

The utilisation of these quick advancing technologies in e-Government raise questions such as; 'to what extent are the technologies used by the society to create impact'. The interface between the government and society strengthens the perception that the utilisation of new technologies by governments can support the realization of society's wider goals. There is an important role for governments in enabling the paradigm shift to an economy that is a lot more efficient and reasonable. Governments that lead will be in a stronger situation to establish an agenda and set advanced positions for businesses and citizens (Hamza *et al.*, 2011).

### 2.4 e-Government Systems

The initial initiatives for e-Government and practical e-Government information systems (IS) started in the early 1990s. Up until now, these systems still possess various challenges such as poor design, faulty systems, insufficient change, and operational management that hinder e-Government systems. Whilst opening an opportunity for interaction between citizens and government and for better service delivery by government, challenges and failure incidents have been recorded throughout the world in both developed and third world countries (Singh and Travica, 2018).

### 2.4.1 e-Government Systems Challenges

After 2 decades of deploying modern-day e-Government, IS rooted on the internet, these systems keep creating big challenges. Poor investment decisions have been made in several cases when expected benefits from the systems did not materialize. Cases of system failures and substantial operational disruption to implementing organizations have been observed and significant disruptions of operations the new systems triggered to the implementing organizations. Heeks (2007) reports that the New Zealand government's system for managing health data spent a seventeen million dollars investment in an American software product that got wasted when the decision to halt the system was made in two years after the system's rollout. The Irish government spent an estimated £56 million on a Health Services Administration system but achieved poor returns. The National Health Service in the United Kingdom wasted an estimated US$24.5 billion on a health care system that could not be deployed effectively (Heeks, 2009).

Singh and Travica (2018) report that South Africa is a Sub-Saharan African country which is the most economically developed country in the area but a developing country in world-wide rankings. Recently, South Africa has been creating a collaborative effort to modernize government operations by introducing various e-Government systems. However, challenges with e-Government systems have been observed in several departments of the government as well as public administration, and across system types. Additionally, malfunctioning of e-Government systems in the country produced inconsistent bills and interruptions in service delivery. South Africa's electronic National Traffic Information System (eNaTIS) was implemented in 2007 in which the department of transport invested US$34 million to implement the system. The system had faults and brought the country's vehicle licensing process to a standstill. Although eNaTIS continued to operate in the subsequent years, it had never completely met users' satisfaction.

### 2.4.2 Zambia's e-Government Systems

Zambia has made some improvements in the transformation of Government operations into a SMART Government, with the establishment of the SMART Zambia Institute (SZI). A good number of systems have been built, implemented and are operational. The deployed and functional systems include the IFMIS, Shared Services, electronic tax system, electronic patents, business registration, e-Cabinet, and electronic entry visa system among other systems.

Bwalya (2009) reports that Zambia's government endeavours to deploy e-Government as an approach to reach citizens to encourage e-participation and e-consultation in the policy and decision-making processes with its people. Different projects have been implemented but have met serious challenges to be utilised by ordinary citizens.

The systems and services that are implemented need to be measured. There is need for SZI to provide service quality and ensure that systems are utilized by the intended users. This can only be achieved by applying change management techniques.

### 2.5 Change Management

Prosci.com (2019) states that "Change management is the discipline that gives guidance on how to prepare, equip and support people to effectively adopt change so as to drive organizational success and outcomes." Although all changes are different and people are

unique, years of research show that there are actions that could be applied to influence individuals in their transitions. Change management offers a structured methodology for championing people in the organization to move from their own present states to future states (Prosci.com, 2019). Change Management (CM) refers to any approach to transitioning individuals, teams, and organizations using methods aimed at redirecting the use of resources, business process, budget allocations, or other modes of operation that significantly redesign an organization. Organizational Change Management (OCM) considers the full organization and what needs to change (Prosci.com, 2019).

### 2.5.1 Importance of Change Management

The significance of change management is to lessen the resistance that may arise as an organisation is undergoing change process, improve on the performance of staff, improve novelty amongst staff, inform stakeholders on the benefits of the change being implemented, create awareness, desire to change, acquire knowledge, ability to change and reinforce change, value realization and end-users to use the system.

The Zambian Government is cognizant of the value of ICT to society in general and has acknowledged this by embarking on various initiatives such as the e-Government to promote the productive usage of ICTs as the basis for effective, efficient, transparent and utilization of available public resources. The introduction of such initiatives brings about change in the way that Government will be interacting and delivering public services to the citizens, business houses, Government departments and agencies as it might alter the processes that have been previously used. This transformation of delivering public services from the traditional manual systems into a fully-fledged provision of online e-Service will require that both ICT Staff and all public service employees undergo responsive change management and stimulate a consistent quicker degree of adoption of systems by the majority citizens (e-Government Strategic and Implementation Plan, 2013).

With change comes a time of exciting prospects for certain individuals and a time of loss, distraction or risk for others. How such responses to change are controlled could be the disparity in between enduring and flourishing in an organisation environment. It can have an influence on a minor area or the whole organisation. However, all change either from

internal or external sources, large or small, requires adopting new mindsets, policies, processes, practices and behaviour.

The risk to the implementation of such change such as poor communication, resistance, inadequate training and insufficient workforce planning among ministries, provinces and spending agencies (MPSAs) and the general citizenry as the key users of these business processes can lead to lack of acceptance for business changes and poor performance at the end-user level. SZI plays a very critical role as the coordinating division for all e-Government initiatives and ensuring that these new technologies and systems being introduced are accepted by all to make public services available to the citizens.

It is therefore critical to create a strong and flexible change that should bring a positive impact on how people perform their roles and responsibilities. The success of the public service in delivering services is dependent upon embracing the transformational culture through individual mindsets.

### 2.5.2   Change Management in Researchers Perspective

The Machiavelli quote from the 16th century reveals that resistance to change is not a new phenomenon or unique to IS. Individuals seem hesitant to adapt to change with ease. Risk is fundamental in all IS projects and user resistance can deepen the risk. Successful implementation of IS varies from unsophisticated applications, for instance, word processing and spreadsheets, to sophisticated applications require user acceptance. IS, especially integrated systems for example Enterprise Resource Planning (ERP) and Supply Chain Management (SCM), frequently intensely impact organizational processes and their way of doing business. Employees are expected to adopt new software, and regularly at the same time adapt to new and profoundly different ways of implementing business processes (Laumer and Eckhardt, 2012).

Perception and forecasting user acceptance of new technology is essential to developers of IS and organizations implementing the new technology. Prosci.com (2019) states that 'experts and investigators need a good understanding why staff members in an organisation resist the utilisation of computers so as to formulate practical approaches of assessing systems, envisaging how users would respond to them, and refining user acceptance by

changing the nature of the systems and the processes by which they are executed'. Experts who create and deploy systems and the researchers who study these systems could benefit from a better understanding of the processes of user acceptance. Systems specialists could use this knowledge to design systems and implementation approaches that users are likely to accept (Laumer and Eckhardt, 2012).

Ziemba and Obłąk (2015) discuss the Critical Success factors (CSFs) which could guarantee that systems and services that are implemented in e-Governance are accepted and used by the intended users. Such factors are top management support; recognize the change; shared vision for change; planning a project; managerial activity; commitment of line managers to change management; effective communication; organization readiness to deal changes; employees training; employees involvement; employees satisfaction; information flow; and performance measurement.

The literature lacks proven scientific theories and experience on the impact of change management on IS projects in public organizations. Therefore, delivering CSFs for change management in IS projects in the public sector turns out to be an essential undertaking. To commence defining CSFs for the public sector, consider the critical factors that are already identified for private sector organisations. Literature gives examples of adapting these factors in public organizations. Most of those factors are similar for private and public organizations (Ziemba and Obłąk, 2015).

Bhatnagar (nd) has his own perspective of CSF to have an enabling e-Government in the third world countries from vision to execution. He proposes to apply the following CSF: clearly identified goals and benefits; significant process re-engineering is needed; start small, move progressively all through phases, manage expectations well and credibility is key; implement established standards and protocols, and reduce customization; in source analysis, outsource design, software development, data preparation, training, etcetera; training expenses should not be minimized; strong political and administrative leadership and use a detailed Project Management (Bhatnagar and Bank, nd). Figure 2.4 illustrates what enablers of e-Government entails:
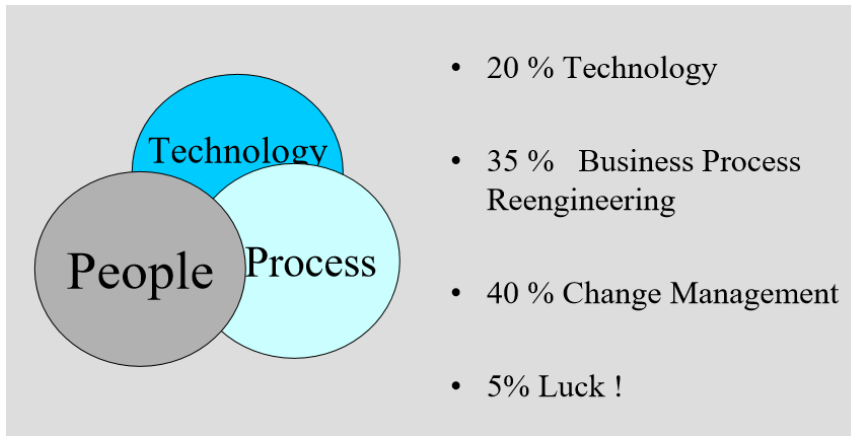
*Figure 2.4:        Enablers of e-Government;*
Source: Bhatnagar (2019)

### 2.5.3    Specific Areas of Technical Assistance

Bhatnagar (nd) recommends that the areas of technical assistance for enabling an e-Government in developing countries should be; assessing e-Government readiness; developing a strategy outlining an application portfolio; assessing the impact of e-Government applications; design and building of secure data networks; re-engineering administrative processes and re-organization  of information ownership and flows to promote sharing across departments; setting up certification authority, payment gateways and enabling e-commerce legislation; sourcing packaged solution for generic applications like e-procurement, on-line portals, Customs and Value Added Tax; and software development, implementation and change management

### 2.6    Theories on Assessment of e-Government Projects

Numerous e-Government assessment frameworks are being used to review the application of e-Government in government institutions at various levels. To assess the usage of e-Government systems in Zambia, an appropriate e-Government assessment framework should be selected. This section aimed at analysing various e-Government frameworks to find a suitable model for this study. Many frameworks present large similarities amongst them and there was a need to find features which would fit into this research study.

Several studies have suggested that ICT has had an impact on improving the performance of private sector organizations mostly in developed countries. However, as for ICT investments by the public sector in the third world countries, many researchers have

observed that previous assessment studies have not used a common framework and that rates of achievements and disappointments have been professed based on purposive samples. Assessment studies had been done to serve a diversity of purposes. Some studies observed at implementation success were the systems running as they were intended to, or the degree to which the stated outcomes were accomplished. Several studies looked at long term sustainability and replicability of the project. There was barely any all-inclusive study that measured the effect on all the stakeholders and covered both short term and long term direct and indirect impacts (Bhatnagar and Singh, 2010).

Heeks and Bailur (2007) investigated an e-Government study and discovered that few studies have recommended how experts can act; most simply describe what experts ought to do without giving an actionable strategy. Generally, e-Government study has not acknowledged that because e-Government is an occasion that has occurred already and is directly associated with daily life, principle and procedure should be considered concurrently.

In recent years, there has been extensive investment in e-Government throughout the developing world. Still, little is known about the impact of those investments, partly due to a lack of assessment guidance. Bhatnagar and Singh (2010) paper reported the development of an assessment methodology that could be used in developing countries to justify investments in e-Government, as well as to establish a performance benchmark for future projects. The framework identifies key stakeholders, dimensions on which the impact needs to be measured, and a methodology of measurement. Client value is measured primarily in two dimensions: cost to the client of accessing services; and perception by the client of quality of service and governance.

### 2.6.1 Theoretical Debates on Assessment Frameworks for e-Government Projects

### a)     Assessment Frameworks based on Economic Theory

Advances in e-services led to the advent of specific economic frameworks for measuring these activities. These frameworks offer valuable dimensions based on cost reduction objectives, with most of them measuring the value characteristics of the system. The overall economic theory that defines how this assessment method is used is Transaction Cost

Economics. Under this assessment technique, value is produced through the reduction of transactional costs in processes. In the case of e-Government systems, these transaction costs could be incurred by saving similar data in several databases (Sterrenberg, 2017).

Traditional economic evaluation methods, for instance, payback approaches, return on investment, net present value and internal rate of return are the widely used methods to assess e-Government activities in public sector organisations. These approaches are focussed on conventional accountancy frameworks that are clearly planned to evaluate the bottom-line financial effect of investments (Sterrenberg, 2017).

Gupta and Bhattacharya (2007) state that the return on investment is not the primary objective when e-Government projects are conceived. They are mostly driven to achieve operational efficiency and effectiveness in service delivery. Governments run with tight budgets, hence there is an increasing demand to re-examine their spending priorities. Further, e-Government programmes are subjected to scrutiny to find out whether they are delivering the payoff as has been promised or not. E-Government being a new phenomenon, at most places, e-Government projects are still found to be in a nascent stage; hence proper information flow for calculating 'return on e-government' considering tangible and intangible benefits cannot be fully ascertained. Moreover, an assessment of the same is not completely possible (Gupta and Bhattacharya, 2007).

Evaluation of e-Government is necessary but approaches are not standard. Choice of an evaluation method would depend on what aspect of e-Government is needed to evaluate. There are three broad identifiable scenarios of evaluation: e-readiness of the context, performance of specific e-government projects or programmes and overall impact of e-Government on various developmental factors. Several approaches have been attempted by the researcher who recommends the choice to be dependent upon a particular situation.

Frameworks based on economic theories such as evaluating e-Government project using multi-weighted methods model were reviewed (Kachwamba and Makombe, 2011). Cost-Benefit Analysis Frameworks (Gupta, et.al., 2007) and finally Bhatnagar and Singh (2010) developed an assessment methodology that may perhaps be used in the third world

countries to justify investments in e-Government and to launch a performance standard for future projects.

However, as additional public sector organisations understand that these theories are incapable of measuring costs and benefits they are left with a dilemma of determining which method to use.

**b)    Assessment Frameworks based on Public Value theory**

The perception of public value is turning out to be more and more common as the modern driver for the improvement of e-Government globally. Consequently, evaluating the public value of e-Government adequately becomes crucial, embodied by the enhancement of a number of frameworks. These frameworks, however, have deficiencies for effectively assessing the public value of e-Government (Karunasena and Deng, 2011).

The study reviewed frameworks based on public value theories. Bai (2013) proposed a conceptual framework for evaluating the performance of e-Government based on public value perspective. Delivery of public services, the effectiveness of public organization and development of trust were identified and selected as three basic public values for analysis. Savoldelli et.,al. (2013) proposed a new framework for measuring the eGEP-2.0 model.  In their paper, they discussed the issue of measuring e-Government and analysed some of the main frameworks of measurement used in practice and at a policy level.

Public Value is another stream that is widely researched on e-Government evaluation frameworks. The concept of public value is a normative theory for evaluating the performance of public services. In most cases, it is used to measure the "context-specific preferences of individuals concerning, on the one hand, the rights, obligations, and benefits to which citizens are entitled, and on the other hand, obligations expected of citizens and their designated representatives" (Sterrenberg, 2017). The increased interest in public value as a measure for e-Government performance is largely due to the fact that it measures the outcomes of e-Government services rather than the technology itself. The main representative papers which have used public value as a way to frame the evaluation of e-Government all share a similar notion of the public value measured through e-Government performance (Bai,2013). Savoldelli et. al. (2013) study, for example, evaluates effective

delivery of public service through the lens of public value but does not consider the quality of e-Government systems attributes like usability, functionality or information. The other frameworks that are generally extensions of this original work, inherit the problem of insufficient attributes for evaluating systems quality. Public value frameworks are also difficult to adapt as the interpretations and meanings of public value within different societies differ, so this makes the development of a common framework challenging to achieve (Sterrenberg, 2017). Additionally, these values are not constant due to the dynamic and changing nature of societal needs over time. Although the public value evaluation frameworks described above deal more comprehensively with the factors for success/failure raised by Heeks (2008) than other frameworks, they still do not deal with the value created by the extensive stakeholders involved in value creation nor the context within which a citizen engages with e-government

**c)** **Assessment Frameworks based on Information System Theory**

Caldas (2003) defines Information Systems (IS) as integrated components operating together to collect, process, store, and publish information to help in decision making, control, coordination, analysis and visualization in an organization. Sterrenberg (2017), states that various government institutions use frameworks to assess systems derived from IS theory. Many of these frameworks are centred on IS success theory which assumes that any comprehensive methodology for assessing systems should include measurement of a system's effectiveness and efficiency, based on its specific capabilities. Other assessment frameworks used by governments are built around IS acceptance theory which supports the inclusion of an assessment of the system's usefulness, perceived ease of use, and users' intention to use the technology in the future.

In order to widen understanding of IS, it is essential to carry out applicable and inclusive IS research. IS research, sequentially, is focused on a basis of robust and strong theory. Certainly, the IS field has a long and prolific practice of developing and appropriating theories to assess central disciplinary themes, such as the IS life cycle and IS business value, alongside with a host of political and social factors. Larsen and Eargle (2015) provide researchers with summarized information on theories widely used in information systems (IS) research. Although this site is a useful resource for the field, a lot more

possibilities will be compiled to assist IS researchers in applying theories to clarify and envisage how IS could be used in today's digital society (Laumer and Eckhardt, 2012).

The study reviewed the literature to discuss how a theory can be used to better understand how IS could be effectively deployed in today's digital world. Technology Acceptance Model, Task-Technology Fit Theory and DeLone and McLean's Success Model were reviewed in this study.

Urbach and Muller (2011) write that the technology acceptance model (TAM) is an information systems theory that models how users come to accept and use technology. The actual system use is the end-point where everyone should be able to use technology, so behavioural Intention should be created, which is a factor that leads people to utilise technology. The behavioural intention is influenced by the attitude which is the general impression of the technology.

The model suggests that when users are presented with new technology, a number of factors influence their decision about how and when they will use it, notably: perceived usefulness, is the degree to which a person believes that using a particular system would enhance his or her job performance. It means whether or not someone perceives that technology to be useful for what they want to do; perceived ease-of-use as defined Davis (1989) in Urbach and Muller (2011) as 'the degree to which a person believes that using a particular system would be free from effort'  If the technology is easy to use, then the barriers will be conquered. If it is not easy to use and the interface is complicated, no one will have a positive attitude towards it. External variables such as social influence is an important factor to determine the attitude. When TAM is in place, people will have the attitude and intention to use the technology. However, the perception may change depending on age and gender because everyone is different.

TAM has widely been criticised, despite its frequent use, leading the original proposers to attempt to redefine it several times. Criticisms of TAM as a "theory" include its questionable empirical value, limited explanatory and predictive power, triviality, and lack of any practical value. TAM "has diverted researchers' attention away from other important research issues and has created an illusion of progress in knowledge accumulation. In

general, TAM focuses on the individual 'user' of a computer, with the concept of 'perceived usefulness', with extension to bring in more and more factors to explain how a user 'perceives' 'usefulness', and ignores the essentially social processes of IS development and implementation, without question where more technology is actually better, and the social consequences of IS use (Chuttur, 2009).

Task-technology fit (TTF) can be defined as 'the degree to which technology assists an individual in performing his or her portfolio of tasks' as reported by Goodhue and Thompson, (1995) in Urbach and Muller (2011). Goodhue and Thompson (1995) developed a measure of task-technology fit that consists of 8 factors: quality, locatability, authorization, compatibility, ease of use/training, production timeliness, systems reliability, and relationship with users. Each factor is measured using between two and ten questions with responses on a seven point scale ranging from strongly disagree to strongly agree.

Goodhue and Thompson (1995) in Urbach and Muller (2011) found the TTF measure, in conjunction with utilization, 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.

Although the Goodhue and Thompson (1995) model operates at the individual level of analysis, Zigurs and Buckland (1998) in Urbach and Muller (2011) present an analogous model operating at the group level. 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.

DeLone and McLean (2003) developed an IS success model in 1992 and updated it in 2003. The DeLone and McLean Information Systems (IS) Success Model is a framework and model for measuring the complex dependent variable in IS research. DeLone and McLean discussed many of the important IS success research contributions focusing especially on

research efforts that apply, validate, challenge, and propose enhancements to their original model. The wide popularity of the model is strong evidence of the need for a comprehensive framework in order to integrate IS research findings.

The updated DeLone and McLean IS Success Model consists of six interrelated dimensions of IS success: information, system and service quality, use/intention to use, user satisfaction, and net benefits. The arrows demonstrate proposed associations between the success dimensions. The model can be interpreted as follows: A system can be evaluated in terms of information, system, and service quality; these characteristics affect the subsequent use or intention to use and user satisfaction. As a result of using the system, certain benefits will be achieved. The net benefits will positively or negatively influence user satisfaction and the further use of the information system.

The modified DeLone and Mclean model collapsed individual and organisation impact into net benefit. The dimension net benefit on the model implies the contribution of the IS to the success of individuals, groups, and organizations. The net benefit that an information system is able to deliver is an important facet of the overall value of the system to its users or to the underlying organization.

DeLone and McLean (2003) made recommendations for future research. They highlight that the model, especially the interdependent relationships between its constructs, should be continuously tested and challenged. The literature reviewed shows that only a few studies use the entire DeLone and Mclean model. Most researchers have modified the model to measure the IS. Urbach and Müller (2011) state that the DeLone and Mclean IS Success Model is likely to witness a new round of extensions and probably even another update, given the rise of more and more service-oriented IS as well as the increasing use of IS in an inter-organizational setting.

### 2.6.2   Review of Empirical Literature Based on Information Systems

a) Idoughi and Abdelhakim (2018) conducted a study in Algeria to assess impacts of system quality, service quality, information quality, digital skills, service awareness, access means, trust, and perceived usefulness on

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expressed satisfaction about e-Government systems. This study aimed at providing a new e-Government assessment model by understanding and evaluating effects of service quality, information quality, system quality, trust, digital skills, access means, and services awareness on users' satisfaction about e-Government services in developing countries' context.

The results supported fourteen out of fifteen hypotheses formulated between the nine constructs. Their findings indicated system quality, information quality, and service quality had positive and significant impacts on trust, perceived usefulness, and users' satisfaction. Also, trust was found to be positively associated with users' digital skills. Moreover, digital skills, service awareness, perceived usefulness, and trust were also found to significantly affect users' satisfaction.

Additionally, access means did not have the hypothesized effects on users' satisfaction; a possible reason was that data collection methods affected respondents' views. Similarly, the significant influence of information quality and system quality on trust indicates that initiatives taken to enhance the information quality and system quality resulted in high users' trust. Also, the significant impact of perceived usefulness on users' satisfaction indicated that the government should make all its efforts to optimize the expenses of accessing e-Government services and time spent by users.

Idoughi and Abdelhakim (2018) study targeted citizens of Algeria to assess the impact of information systems on the e-Government services which is contrary to the objective of this study. In addition, the researchers did not state which services were being assessed.

b) Ojo (2017) did a study in Nigeria to validate the DeLone and McLean information system (IS) success model in the context of a hospital information system (IS) in a developing country. System quality and use were found to be important measures of hospital information system success.

Ojo's study was based on the citizens of Nigeria who access the hospital information system. The empirical testing of the DeLone and McLean model in the study should have been extended to cover a wider variety of systems and not only hospital information system.

c) Stefanovic *et al,* (2016) empirically assessed the model for measuring the success of e-Government systems which comprised constructs from the updated DeLone and McLean IS success model which included the demographic conditions. By using the information system (IS) success-based approaches from the perspective of government employees, their paper investigated the success of e-Government systems. Structural equation modelling (SEM) techniques were applied to data collected by a questionnaire from 154 employees of e-government systems in Serbia. Their analysis showed that information quality, service quality and service quality had a positive impact on the intention to use, and that only system quality had a significant effect on user satisfaction. Intention to use/use had a positive and direct effect on user satisfaction.

In as much as Stefanovic *et al,* (2016) study is in line with the objective of this study, however, their study generalised the e-Government systems which were assessed. Stating the types of e-Government systems that should be assessed is important for the target audience to know which systems were being referred to. When governments are implementing e-Governments initiatives, not all projects are implemented successfully. Stefanovic *et al,* (2016) did not show which systems performed well against the unsuccessful ones. In addition, some of the variables they used to measure the success of IS in Serbia were ambiguous.

Nwone (2014) conducted a study in Nigeria to examine the influence of IS characteristics that is; system quality, information quality and service quality derived from the updated DeLone and McLean (2003) IS success model. Nwone argues that amongst the IS models, Delone and McLean IS

success model is one of the most widely cited. In addition to the influence of a hypothesized technological infrastructural factor on postgraduate students' satisfaction of the University of Ibadan postgraduate school web portal. The results showed that all the information system characteristics; system quality, service quality, information quality, and technological /infrastructural factor in that order, significantly influenced postgraduate students' satisfaction of the web portal.

The empirical testing of the DeLone and McLean model in Nwone's study should have been extended to cover a wider variety of systems. In order to provide a basis for the much needed cumulative tradition of IS research, DeLone and McLean (2003) urged future users of their model to consider using proven measures where possible. Only a significant reduction in the number of measures used can make results comparable beyond the various contexts of IS success studies.

Information quality, system quality, and service quality belong to the system development level; while system use, user satisfaction, and perceived net benefit belong to the effectiveness-influence level (DeLone & McLean, 2003). Establishing strategies to improve only one success variable is therefore an incomplete strategy if the effects of the others are not considered (Wang and Liao, 2008).

d) Urbach and Benjamin (2012) conducted a study to give a synopsis of the current state of the research on the IS Success Model. They claim that DeLone and McLean IS Success Model is fully adapted to a specific research problem using newly developed constructs that are similar to those of the original model. It offers a concise entry point to the theory's background and its application. They argue that work using the DeLone and McLean IS Success Model will remain popular in the years to come. Its update gives a strong argument for the model's accuracy and thriftiness and many studies using the model provide a broad basis of empirical support

and proven measures. The user satisfaction (US) success dimension comprises the user's level of satisfaction when applying an IS. It is said to be one of a critical measure of IS success. Assessing US becomes especially useful when the use of an IS is compulsory and the amount of use is not an appropriate indicator of the success of the system.

e) Gupta *et al*, (2007) conducted a study to evaluate e-Government programmes which focused on the various parameters for evaluating the success of e-Governance projects. They reckon that usage of e-Government services determines the return on investment. They recommend that people's awareness concerning e-Government services must be increased widely to ensure higher utilisation and maximise the return on investment.

f) Stojanovic *et al,* (2006) conducted a study in Europe to consider change management (CM) process as a continual improvement process to enhance the usability of e-Government services. e-Government systems are subject to a continual change. It is clear that ad hoc management of changes in e-Government might work only for particular cases. To avoid drawbacks in the implementation of systems, the CM must be treated in a more systematic way. CM is a continual improvement process. To improve the usability of e-Government services with respect to the needs of users.

g) Iivari (2005) carried out a study in Finland to tests the model of information system success proposed by DeLone and McLean using a field study of a mandatory IS. The study was conducted in Oulu City Council, which is a municipal organization of about 7500 employees. The organization in question formed a concrete setting where some of its employees were working on the adoption of a new information system and shaping its organizational acceptance. The field study was targeted at about 100 primary users of the system who participated in the training provided by the vendor. The results showed that perceived system quality and perceived information quality were significant predictors of user satisfaction with the system, but not of

system use. Perceived system quality emerged as more significant than perceived information quality. Perceived system quality was also a significant predictor of system use. User satisfaction was found to be a strong predictor of individual impact, whereas the influence of system use on individual impact was insignificant.

Iivari study focused only on one system in one organization. He reports that there is a shortage of empirical tests of the DeLone and McLean model, which is contrary to a good number of researchers who report that the DeLone and McLean model is the most sought model. Urbach and Müller (2011) ague that work using the D&M IS Success Model will remain popular in the years to come. Its update provides a powerful argument for the model's accuracy and parsimony and the many studies using the model provide a broad basis of empirical support and proven measures.

h) Almutairi and Subramanian (2005) presented an empirical application of the DeLone and McLean model in private sector organizations of Kuwait. Their findings were that certain direct associations between the variables in the original DeLone and McLean model were supported from initial correlation analysis. Subsequent regression analyses confirmed these associations. They found that information quality and system quality impact user satisfaction significantly. They further found that system usage had a significant influence on individual impact.

Almutairi and Subramanian (2005) used an old DeLone and McLean model which was reported to be ambiguous as a causal-explanatory model by other researchers as stated in Iivari (2005). The study focussed on a private sector of Kuwait contrary to the aim of this study of assessing the utilisation of e-Government systems in the government.

i) Urbach et el. (2009) examined multidimensional approaches to measuring IS success and explored the current state of IS success research through a literature review and by classifying empirical articles that were published

between 2003 and 2007. Measuring information systems (IS) success has been and is of great interest to both researchers and practitioners. Based on a total of 41 academic journal and conferences publications, the study identified the relevant research carried out, categorizes and consolidates the research results, and discussed them. The results showed that the dominant empirical research is that which analyzes the individual impact of a certain type of information system that the users evaluate by means of surveys and structural equation modelling. The DeLone and McLean Information Systems Success Model is the main theoretical basis of the reviewed studies. The results provide researchers who are new to this topic with a comprehensive review of IS success research. Furthermore, opportunities for additional development are identified and future research directions suggested.

j) Wang and Liao (2008) measured the success of G2C e-Government systems from the citizen's perspective. Their study provided the first empirical test of an adaptation of DeLone and McLean's IS success model in the context of G2C e-Government. The model consists of six dimensions: information quality, system quality, service quality, use, user satisfaction, and perceived net benefit. Structural equation modelling techniques were applied to data collected by questionnaire from 119 users of G2C e-Government systems in Taiwan. Except for the link from system quality to use, the hypothesized relationships between the six success variables were significantly supported by the data.

k) Wu and Wang (2006) proposed and empirically assessed a Knowledge Management System (KMS) success model in Taiwan targeting private firms. This was derived through an analysis of the best practice of knowledge management and review of IS success literature. Five variables namely; system quality, knowledge or information quality, perceived KMS benefits, user satisfaction, and system use was used as dependent variables in evaluating KMS success, and their interrelationships were suggested and

empirically tested. Wu and Wang (2006) report that DeLone and McLean's IS success model has received much attention among IS researchers, and it provides a foundation for research in the KMS domain. Their study specified DeLone and McLean's model to measure KMS success and validates its use in empirical surveys about KMS.

The empirical results provided considerable support for the model. Five of the seven hypothesized relationships were found to be significant. The results of their study indicated that system quality, knowledge or information quality and perceived benefits had a significantly positive influence on user satisfaction. In addition, user satisfaction and perceived KMS benefits had a direct effect on KMS use. The other findings were that the system quality of the KMS did not have a significant direct influence on user-perceived benefits was inconsistent with most prior MIS research. They also found that perceived KMS benefits had a positive influence on user satisfaction and that perceived KMS benefits and user satisfaction had a direct positive effect on system use but that system use had no significant positive effect on user-perceived KMS benefits.

## 2.7 Research Framework

## 2.7.1 Theoretical Framework

Kumar (2011) states that a theoretical framework is used to provide the rationale for conducting the research. Literature reviewed that the problem to be investigated had its roots in various theories that had been developed from different perspectives. The information obtained from different sources needed to be sorted under the main themes and theories, highlighting agreements and disagreements among the authors. This was done in section 2.6.

Among the various theories explored, Information System (IS) theory was drawn for this study because e-Government systems are considered to be an aspect of IS. There are various researchers who designed IS models to assess the e-Government systems: Davis (1989) developed a Technology Acceptance Model; Goodhue and Thompson (1995)

developed a Task-Technology Fit model as quoted in Larsen and Eargle (2015), and DeLone and McLean (2003) developed a DeLone and McLean's (D&M) IS Success Model among others.

This study borrowed the concept to develop its model from DeLone and McLean (2003) who created their first model in 1992 and thereafter updated it in 2003. The DeLone and McLean (2003) is an IS theory which tries to offer a thorough understanding of IS success by way of identifying, explaining, and describing the interactions amongst six of the most important dimensions of success alongside which IS are generally assessed. These dimensions are system quality; information quality; service quality; intention to use/use; user satisfaction; and net benefit (DeLone and McLean, 2003). Figure 2.5 is a DeLone and McLean (2003) IS Success Model.

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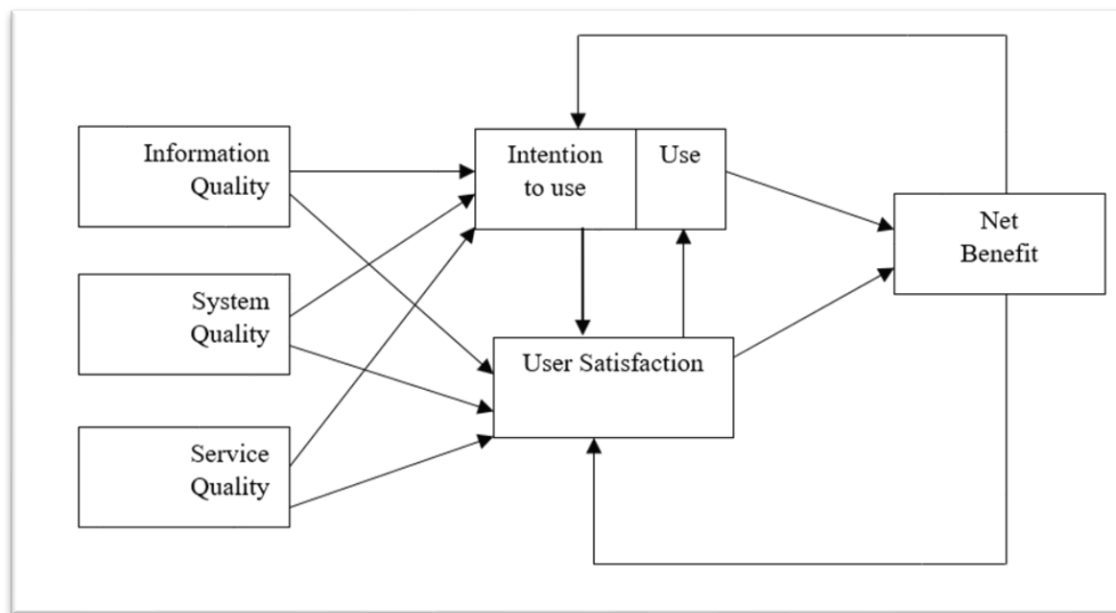


*Figure 2.5:*      *DeLone & McLean IS Success Model*
Source: Delone and Mclean (2003)

The arrows in Figure 2.5 illustrate associations among the success dimensions. Looking at its constructs and their interrelationships, the model describes an IS system to be measured in terms of information, system, and service quality. These qualities affect subsequent use or intention to use and user satisfaction. Some benefits could be accomplished by utilising the

system. The net benefits can influence positively or negatively user satisfaction and the further use of the IS (Urbach and Mueller, 2012). Although DeLone and McLean (2003) have refined their first model and presented an updated version, they encourage other researchers to develop the model further and help to continue its evolution.

The DeLone and McLean model has extensively been used by IS researchers for understanding and measuring IS success. The components of DeLone and McLean (2003) IS success model are described below as:

i. **System quality** – the desired attributes of an IS, such as user-friendliness, system availability, system dependability, ease of learning and system features of intuitiveness, intricacy, flexibility, and very minimal downtime;

ii. **Information quality** – the desired attributes of the system outputs such as, management reports and web pages. These outputs should be relevant, accurate, understandable, current and timely;

iii. **Service quality** – the quality support that system users receive from the IS department and IT support personnel. For instance, receptiveness, accuracy, reliability, technical competence, and empathy of the personnel staff;

iv. **System use** – the extent and approach in which staff and clients utilize the abilities of an IS. Such as measure of utilisation, frequency of use, kind of use, relevance of use, degree of use, and intention of use;

v. **User satisfaction** – consumer's level of satisfaction with reports such as web sites, and support services; and

vi. **Net benefits** – the degree to which IS is contributing to the success of individuals, groups, organizations, industries, and nations. For instance, improved decision making, improved productivity, increased sales, improved profits, cost reductions, consumer welfare, market efficiency, creation of jobs, and economic and socio development.

### 2.7.2 Conceptual Framework

The conceptual framework is the foundation of the research problem. It stems from the theoretical framework and usually focuses on the sections which become the basis of study. Whereas the theoretical framework consists of the theories or issues in which study is

embedded, the conceptual framework describes the aspects selected from the theoretical framework to become the basis of enquiry. The conceptual framework grows out of the theoretical framework and relates to the specific research problem (Kumar, 2011).

To assess the usage of e-Government systems in Zambia, the study drew on the work of DeLone and McLean (2003) model. The suggested model is based on the review of previous research results that is Stefanovic *et al.* (2016), Nwone (2014), Urbach and Mueller (2012), Idoughi and Abdelhakim (2018). The reason for adopting this framework is that it fits into the context of the research title of this study.

Using the DeLone and McLean (2003) model, the study developed its own model to assess the utilization of e-Government systems by government employees. All the DeLone and McLean (2003) constructs were retained except for net benefit. In this study net benefit was incorporated into user satisfaction since net benefit of an information system in an organisation could only be preceded by user satisfaction. The constructs obtained from this model were system quality, information quality and service quality as independent variables whilst Intention to use/use, change management and user satisfaction as dependent variables. The resultant conceptual model in Figure 2.6 is an e-Government Systems Assessment model adapted from DeLone and McLean's (2003) IS success model.
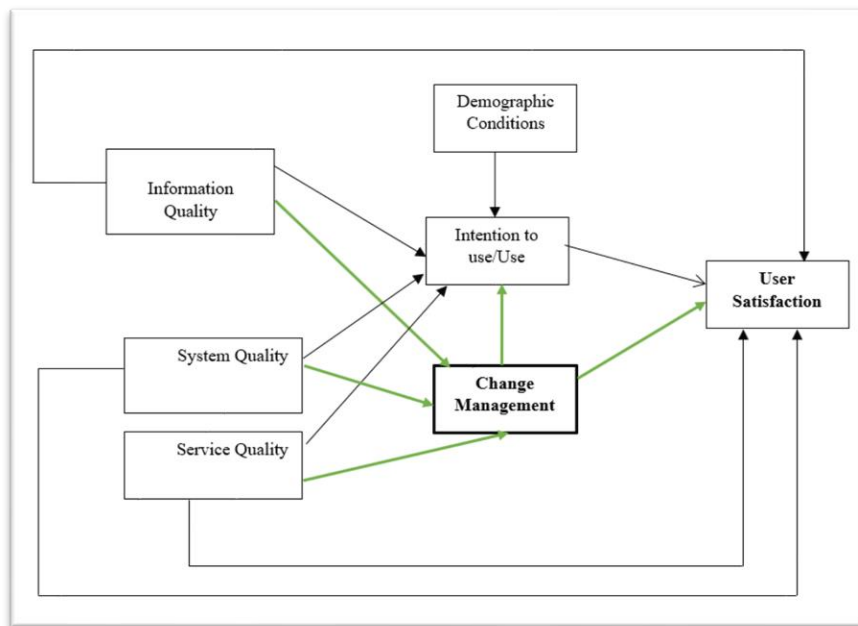
*Figure 2.6:*          *e-Government Systems Assessment Model*

This study assumes that user satisfaction of an IS means constructive experience of use of that system, therefore a construct net benefit was dropped because this study assumes that it is tantamount to user satisfaction. User satisfaction is the degree of user effectiveness and satisfaction with the results. This study assumes that, when the users are satisfied with the systems, the organisations will benefit from the use of the systems. User satisfaction directly influences the net benefits provided by an information system. Satisfaction refers to the extent to which a user is pleased or contented with the information system, and is posited to be directly affected by system use.

Urbach and Mueller (2012) state that "measuring user satisfaction come to be useful when the use of an IS is mandatory, and the amount of use is not a suitable indicator of systems success". Some e-Government systems mentioned in this study are mandatory for government employees to use such as government e-mail MS Outlook and IFMIS whereas skype for business and SharePoint are optional, hence use/intention to use was maintained. Net benefit as a construct was dropped since measuring it would be out of context in this study.

The objective of the study was to assess the utilization of e-Government Systems by government employees. In order to meet this objective, the study assessed the government employees' general satisfaction with the e-Government applications.  A dimension "Change Management" was added on the e-Government assessment model to measure awareness, training and ability to use the system. The study also included demographic conditions dimension which was missing on the DeLone and Mclean model. Demographic conditions help a study survey to understand the personnel details of a target audience in a survey.

### 2.7.3   Components of the e-Government Assessment Model

*a.*          **Information Quality and User Satisfaction**

The association concerning information quality and user satisfaction is firmly supported in the literature. Studies have found a consistent relationship between information quality and

user satisfaction (Stefanovic *et al.*, 2016). This study aimed at finding a significant relationship between measures of information quality and user satisfaction. The variables that were used for this dimension were; 'reliability', 'sufficient', 'precise', 'accurate' and 'information that fit users' needs.

*b.* **System Quality and User Satisfaction**

Nwone (2014) found strong support for the interrelationship between system quality and user satisfaction. The functionality of a management information system for example, which is one measure of system quality, has been found to be significantly related to user satisfaction (Iivari, 2005). For knowledge management systems, system quality was also found to be strongly related to user satisfaction (Urbach et al, 2008). For e-Government systems, system quality, measured as user-friendliness and usability, is significantly related to user satisfaction (Stefanovic et al, 2016). Researchers have also examined more general IS and found a strong relationship between system quality and user satisfaction using a variety of measures and IS. The variables that were used for this dimension were; 'user-friendliness' and 'desired services'.

*c.* **Service Quality and User Satisfaction**

Idoughi and Abdelhakim (2018) define service quality as the consequential outcome of a comparative analysis between the anticipated service and its real performance judged by the end-users. Therefore, if users have greater expectations from an installed system in comparison to what is actually delivered, the system would be perceived as not to have met the expectations. DeLone and McLean (2003) emphasized that service quality has a significant influence on users' satisfaction. They stated that 'the changes in the role of IS over the last decade argue for a separate variable of the ''service quality'' dimension'. There is a great deal of research about measuring the quality of e-Government services from the perspective of different stakeholders to evaluate and improve it. Literature reviews that e-Government success depends highly on service quality and how user-centred they are. Cohen (2006) stated that e-Government services were found to significantly influence expressed satisfaction after analysing internet use as a means of communication by American people with their government.

In this study, the variables used to measure service quality were; 'ready to help', 'secure and protect privacy', 'availability', 'provides individual attention', and 'understands specific needs'. It measured the gap between the people's expectations and the quality of the received service.

### d.      Demographic Conditions and Use /Intention to Use

The demographic characteristics include age in years, gender, years in work experience, institutions and job position of the government employee. The original and updated D&M IS Success model do not have demographic conditions (DC) as variables to measure IS Success. The study obtained the concept of DC from Stefanovic *et al.* (2016). Previous empirical studies confirmed the determining effects of DCs in e-Government system use. Nwone (2014) measured DC and found determining effects on the use of e-Government portal in the case of sex, income or job position, residential categories, and partisanship. Drawing on empirical results, Stefanovic *et al.* (2016) found that DCs have a positive effect on use/intention to use of an e-Government system's employees.

### e.      Use/Intention to Use and User Satisfaction

The dimension intention to/use signifies the extent and way where an IS is used by its users. Urbach and Mueller (2012) argue that assessing the usage of an IS is a wide notion that could be considered from several perceptions. If there should arise an occurrence of voluntary use, the actual use of an IS could be suitable success measure. Urbach, et. al. (2008) review that previous studies measured use objectively by capturing the connect time of a system, its functionality or the number of times a system is used. As the frequency a system is used is seemingly not a sufficient success measure, other studies employed subjective measures by probing users about their perceived use of a system. Stefanovic et. al. (2016) state that when the use/intention to use of an e-Government system is higher, user satisfaction (US) will increase this direct effect. Consequently, the use of the system, through a direct effect on user satisfaction, can also affect the success of these systems. Due to difficulties in interpreting the dimension 'Use', DeLone and McLean (2003) suggest 'Intention to Use' as an alternative measure to 'Use' in certain situations. In this study, the variables used to measure use/intention to use were; 'frequency of use' and 'dependency'.

**f.      Change Management and User Satisfaction**

Change Management (CM) was a new construct included in the e-Government assessment model. CM is the process, tools and techniques used to manage the people in an organization on how best they can adapt to change that is being introduced and thereby adding value. With the execution of e-Government in Zambia, there is a lot of change happening. People need to be managed on how to accept the changes that are being introduced in the country.

The green lines on the e-Government Assessment model were included on the constructs suggesting that change management will be affected by system quality, information quality and service quality. Secondly, change management will impact use/intention to use and user satisfaction. It is the quality of the systems, information and services provided by an organisation which will ensure that people adapt to the change that is being suggested. When people are satisfied with the systems, then they will have the desire to use the system.

For e-Government initiatives to succeed, in addition to modernising the front office, attention should be paid to streamline, re-organise and support the back-office processes of public administrations that provide e-Government services to citizens (Stojanovic et al, 2006). Therefore, change management (CM) has a positive effect on User Satisfaction. When users receive service awareness and are trained in the use of systems, they will be satisfied with the use of systems. The variables that were used for this dimension were; 'awareness', 'training', makes job easier' and 'usefulness'.

**g.      *User Satisfaction***

According to DeLone & McLean (2003), user satisfaction (US) is the general concept the users of the systems have about the e-Government systems. US is the dimension that describes the attitudes that users have towards the systems that they use. It measures the government employees' fulfilment with the e-Government systems in terms of satisfaction with the e-Government systems, how users perceive quality, and whether they have fulfilled expectations on e-Government systems.

## 2.8 Quality Management

The model of this study highlighted the importance of system quality, information quality, service quality, intention to use/use, and change management as a driving force in obtaining user satisfaction such as higher performance of government employees. In general, the e-Government department needs to improve the performance of government employees' operations to assess their productivity and efficiency. This needs to be performed at least twice in a year. There is a need to develop a Quality Management model which will enable government representatives to assess the overall strength as well as the effectiveness of their e-Government systems. Such information allows decision-makers of the government to carry out corrective actions in order to increase the effectiveness of e-Government systems, develop strategies to address problems, provide better service for citizens and businesses, and create more efficient public administration. Governments can use this assessment model to improve the utilization levels of e-Government systems.

### 2.8.1 Service Quality

Measuring service quality is of importance for e-Government, as most governments regard the improvement of service quality presented to the public as a significant objective of e-Government programmes. Quality standards, which vary for individual projects, need to be developed regarding broader service standards and charters. Quality of e-Government services is measured as users' satisfaction, assessed through interviews or online questionnaires. Frequent surveys of users' satisfaction are of importance in e-Government, as customer's expectations and behaviours are progressing swiftly in a varying service environment. Findings from the surveys could be used to identify improvements that meet user needs by making services more available and effective. Findings could also be used to revise service quality standards (Organisation for Economic Co-operation and Development, 2007).

Time and budgets are quantitative measures of performance that readily fit into the integrated information system. Qualitative measures for instance meeting a client's technical requirements and product function is most regularly defined by on-site check, or how well the product is utilised (Larson and Gray, 2017).

### 2.8.2    Quality Management in Context

Quality management ensures that an organization, product or service is consistent. It has four main components: quality planning, quality assurance, quality control and quality improvement. Quality management is focused not only on product and service quality but also on the means to achieve it. Quality management, therefore, uses quality assurance and control of processes as well as products to achieve more consistent quality. What a customer wants and is willing to pay for it determines quality. It is a written or unwritten commitment to a known or unknown consumer in the market. Thus, quality can be defined as fitness for the intended use or, in other words, how well the product performs its intended function (Project Management Institute, 2017).

Quality Management involves processes or activities of the performing organisation that determine quality policies, objectives, responsibilities so that the project satisfies the needs for which it was undertaken. It implements the quality management system through policy and procedures.

### 2.8.3   Managing for Quality in Organisations

**a)        Total Quality Management**

Total Quality Management (TQM) is an approach to improving the effectiveness and flexibilities of business as a whole. It is essentially a way of organizing and involving the whole organization, every department, every activity and every single person at every level. TQM ensures that the management adopts a strategic overview of the quality and focuses on prevention rather than inspection (Project Management Institute, 2017).

Project Quality Management includes the processes for incorporating the organization's quality policy regarding planning, managing, and controlling project and product quality requirements in order to meet stakeholders' objectives. Project Quality Management also supports continuous process improvement activities as undertaken on behalf of the performing organization (Project Management Institute, 2017).

A summary of key findings from literature which highlight underlying concepts in the study is shown in Table 2.1

**Table 2.1:**        **Summary of Key Findings from Literature**

| Author | Country/ Region | Title | Objectives | Methodology | Conclusions / Comments |
|---|---|---|---|---|---|
| 7NDP (2017) | The Republic of Zambia | Seventh National Development Plan; 2017 - 2021 | To increase investments in ICT infrastructure and human resource development. | Explanatory | There is need to Strengthen legal framework of ICTs and improve ICT infrastructure for service delivery and provide electronic services |
| Almarabeh, and AbuAli (2010). | Europe | A General Framework for e-Government; Definition Maturity Challenges, Opportunities, and Success | To discuss answers to 3 main questions related to e-Government: What, Why and How e-Government | Literature Review; | Discussed definitions of the e-Government, maturity, critical success factors, risks and obstacles, how to achieve a reliable and Successful e-Government. Each country should take in consideration all of these aspects, and work on improving it in such a way, that will lead to a comprehensive successful e-Gov. |
| Almutairi and Subramanian (2005) | Kuwait | An Empirical Application of the DeLone and McLean Model in the Kuwaiti Private Sector | To represent an empirical application of the DeLone and McLean model in private sector organizations of Kuwait | Literature analysis; | Seven organizations representing the seven sectors in the Kuwaiti Stock market participated. Certain direct associations between the variables in the original DeLone and McLean model were supported from initial correlation analysis. Subsequent regression analyses confirmed these associations. Information quality and system quality impact user satisfaction significantly. System usage has a significant influence on individual impact. |

| Author | Country/ Region | Title | Objectives | Methodology | Conclusions / Comments |
|---|---|---|---|---|---|
| Bhatnagar and Singh (2010) | India | Assessing the Impact of e-Government | To develop an assessment methodology that could be used in developing countries to justify investments in e-Government, and to establish a performance benchmark for future projects. | Explanatory | Client value is measured primarily in two dimensions:1) cost to the client of accessing services, and 2) perception by the client of quality of service and governance. In a limited way, the financial cost benefit impact to the agency implementing the project is also studied. |
| Delone and McLean (2003) | Global | The DeLone and McLean Model of Information Systems Success: A Ten-Year Update | To discuss many of the important IS success research contributions of the last decade, focusing especially on research efforts that apply, validate, challenge, and propose enhancements to the original model | Explanatory, Empirical Analysis, Literature Review | "System Use" is a critical dimension of IS success measurement. Actual use measures should be preferred to self-reported use measures. Also, usage measures should capture the richness of use as a system phenomenon including the nature, level, and appropriateness of use, and should not simply measure the frequency of use. |
| Fitsilis et al (2009) | Global | Assessment Frameworks of e-Government Projects: a Comparison. Department of Project Management | To present, an evaluation of the most well known assessment frameworks for e-Government software projects' | Explanatory | An "ideal" e-Gov assessment framework should combine five different and concrete perspectives namely: project organization perspective, project processes perspective, project results perspective, social and economics perspective, citizen satisfaction perspective. |
| Gupta and Bhattacharya (2007) | India | Evaluating e-government | To focuses on the various parameters for evaluating the success of e-governance projects | Case Studies | Usage of e-government services determines the return on investment. People's awareness about e-government services must be increased extensively to |

| Author | Country/ Region | Title | Objectives | Methodology | Conclusions / Comments |
|---|---|---|---|---|---|
| | | | | | ensure higher usage and maximise the return on investment. |
| ICT Policy (2006) | The Republic of Zambia | National Information and Communication Technology Policy | It is expected that all MPSAs shall take the National ICT Policy as a guiding document to assist in developing sector-specific ICT policies and plans that will allow the application of ICTs in their respective programmes and projects. | Explanatory | ICT is an enabler to build an information centered society where everyone can create, access, utilize and share information and knowledge leading to greater productivity, greater competitiveness and sustainable economic growth, a precondition for poverty reduction. ICTs can also be used as an effective tool in enhancing good governance. |
| Idoughi and Abdelhakim (2018) | Algeria | Developing Countries E-Government Services Evaluation Identifying and Testing | To examines impacts of system quality, information quality, service quality, digital skills, access means, service awareness, trust, and perceived usefulness on expressed satisfaction about e-government services | Explanatory | The positive and significant impacts of system, information, and service qualities on users' satisfaction indicates the better the quality of services providing information through the e-government system results in higher users' satisfaction with e-government services. |
| Iivari (2005) | Finland | An Empirical Test of the DeLone-McLean Model of Information System Success | To tests the model of information system success proposed by DeLone and McLean using a field study of a mandatory information system. | Observation | The results show that perceived system quality and perceived information quality are significant predictors of user satisfaction with the system, but not of system use. Perceived system quality was also a significant predictor of system use. User satisfaction was found to be a strong predictor of individual impact, whereas the influence of system use on individual impact was insignificant. |
| Nwone (2014) | Nigeria | Exploratory Study of Information System User | To examine the influence of IS characteristics namely; system | Descriptive Survey | All the information system characteristics; system quality service quality, information |

| Author | Country/ Region | Title | Objectives | Methodology | Conclusions / Comments |
|---|---|---|---|---|---|
| | | Satisfaction: A Study of University of Ibadan Post Graduate School Web Portal | quality, information quality and service quality derived from the extended D&M (2003) IS success model. | | quality, and technological /infrastructural factor in that order, significantly influenced postgraduate students satisfaction of the web portal. |
| Ojo (2017) | Nigeria | Validation of the DeLone and McLean Information Systems Success Model; | To validate the DeLone and McLean information system success model in the context of a hospital IS in a developing country | Literature Review | System quality and use were found to be important measures of hospital information system success. It is, therefore, imperative that hospital information systems are designed in such ways that are easy to use, flexible, and functional to serve their purpose. |
| Singh and Travica (2018) | South Africa | e-Government systems in South Africa; The Electronic Journal of Information Systems in Developing Countries | To investigate challenges surrounding e-Government systems in South Africa and their origins | Critical Analysis | A specialized cultural analysis based on the informing culture framework was applied in order to deepen understanding of the challenges' origins. It revealed a hybrid of an immature bureaucracy and a mature clan informing culture as deep-seated aspects of the socio-organizational context surrounding South African e-Government systems. |
| SMART Zambia e-Government Master Plan (2018) | The Republic of Zambia | SMART Zambia e-Government Master Plan – 2018 - 2030 | Smart Zambia e-Government Master Plan aims at improving and transforming the way government delivers services to its citizens as well as to business organisations and within itself. The e-Government Master Plan will ensure an integrated approach to the development of e- | Explanatory | The document serves as the principal working document for management to meet the present and future needs of government services through short and long-term plans. The **Master Plan** aims at digitalising Line Ministries, Public Service Agencies and Local Authorities; strengthening their operations; and making them more responsive to the needs of the citizenry. The SMART |

| Author | Country/ Region | Title | Objectives | Methodology | Conclusions / Comments |
|---|---|---|---|---|---|
| | | | Government and related Information and Communication Technology (ICT) services. | | Zambia eGovernment Master Plan will transform the Government into a connected entity that responds to the needs of its citizens by developing an integrated electronic platform. |
| Stefanovic et, al. (2016) | Serbia | Assessing the Success of e-Government Systems: An Employee Perspective, Information and Management | To investigate the success of e-Government systems. | Literature Review | The researchers empirically evaluated the model for measuring the success of e-Government systems consisting of constructs from the updated DeLone and McLean IS success model coupled with the demographic conditions |
| Stojanovic and Apostolou (2006) | Europe | Change management (CM) in e-Government: On to Gov case study | To consider CM process as a continual improvement process. To improve the usability of e-Government services, | Explanatory | e-Government systems are subject to a continual change. It is clear that ad hoc management of changes in e-Government might work only for particular cases. To avoid drawbacks in the long-run, the CM must be treated in a more systematic way. This approach goes beyond a standard CM process; rather it is a continual improvement process. To improve the usability of e-Government services with respect to the needs of users, |
| e-Government Strategic and Implementation Plan (2013) | Zambia | The e-Government Strategic and implementation Plan, 2013-2016 | to transform the way it interacts and delivers services to citizens, businesses and across government departments and agencies by bringing government closer to the people and making service delivery more friendly, convenient, transparent, efficient | Explanatory | The focus of the e-Government project will be on improving coordination and implementation of e-government systems at national, provincial and district levels. The Cabinet Office e- Government secretariat will ensure that the implementation Plan and M&E Framework is adhered to by the various |

| Author | Country/ Region | Title | Objectives | Methodology | Conclusions / Comments |
|---|---|---|---|---|---|
| | | | and cost effective through the implementation of e-Government. | | implementing institutions, including the reporting requirements. There will be need for an appropriate Policy and Legal Framework to support the implementation. |
| United Nations E-Government Survey (2010) | Global | Leveraging e-Government at a time of financial and economic crisis; Economic and Social Affairs | To discuss ways in which e-Government can be leveraged to mitigate the effects of the financial and economic crisis on development. The state of e-government around the world | Literature review and an analysis of the Survey's data. | A global agreement on a consistent framework for measuring e-Government development is called for. Such a platform will likely avoid inconsistent meanings and interpretation by national and local governments, allow for the more effective adoption of best practice solutions from around the world and advance the international comparison of e-Government usage and development. |
| United Nations, E-Government Survey (2018) | Global | Gearing e-Government to support transformation towards sustainable and resilient societies | To provide new analysis and evidence to further utilize the potential of e-Government to support the 2030 Agenda. | Literature review and an analysis of the Survey's data. | This edition examines how governments can use e-government and information technologies to build sustainable and resilient societies. |
| Urbach and Müller (2011) | Global | The Updated DeLone and McLean Model of Information Systems Success | To give an overview of the current state of research on the IS Success Model. It offers a concise entry point to the theory's background and its application. | Literature Review; Explanatory; Empirical Analysis | Work using the D&M IS Success Model will remain popular in the years to come. Its update provides a powerful argument for the model's accuracy and parsimony and the many studies using the model provide a broad basis of empirical support and proven measures. |
| Ziemba and Obłąk (2015) | Poland | Change management (CM) in information systems | To identify critical success factors (CFSs) for CM in IS projects. In order to reach this aim an explanation of changes in public | Critical analysis of the literature; case studies; creative | The research is about CM in IS projects in two ways. Firstly, the identification of CSFs for CM in IS project was made. Twelve CSFs have been identified, |

| Author | Country/ Region | Title | Objectives | Methodology | Conclusions / Comments |
|---|---|---|---|---|---|
| | | projects for public organizations in Poland. | organizations and the nature of CM are presented | thinking and logical deduction | Secondly, it showed practical issues concerning those identified CSFs and, consequently, the effect of CM on IS project success |

## 2.9    Summary

This chapter presented a review of relevant literature that was applicable to the study. Many e-Government assessment frameworks have been used to assess the implementation of e-Government in governments at different levels. In order to assess the usage of e-Government systems in Zambia, a suitable e-Government assessment framework needed to be selected. This chapter aimed at analysing various e-Government frameworks to find an appropriate model for this study. The following chapter is research methodologies which show how the study was conducted and describes various methods that were used during the research.

# CHAPTER 3: RESEARCH METHODOLOGY

## 3.1    Introduction

The previous chapter presented reviewed literature on assessing the usage of e-Government Systems. The purpose of this chapter is to show how the study was conducted and to describe various methods that were used during the research. This chapter discusses the methods and research designs used. It also reveals the sampling techniques, sample size and sampling methods used in the study. Furthermore, the chapter likewise deals with data collection instruments and methods of administering data collection instruments as well as analysis techniques.

## 3.2    Research Methodology

Research methodology is a systematic process of solving a research problem. It is a science of studying how research is carried out scientifically. It generally encompasses various steps followed by researchers in studying research problems adopting logical sequences. They should have ideas about a particular technique to be used among the available techniques. Thus, proper knowledge of research methodology enables a researcher to accomplish his or her research projects in a meticulous way. Research methodology helps a researcher in identifying the problems, formulating problems and hypotheses, gathering information, participating in the fieldwork, using appropriate statistical tools, considering evidences, drawing inferences from the collected information or experiment. Research methodology has a great role to play in solving a research problem in a holistic way by the researcher (Sahu, 2013). Figure 3.1 shows a framework through which the research was carried out.
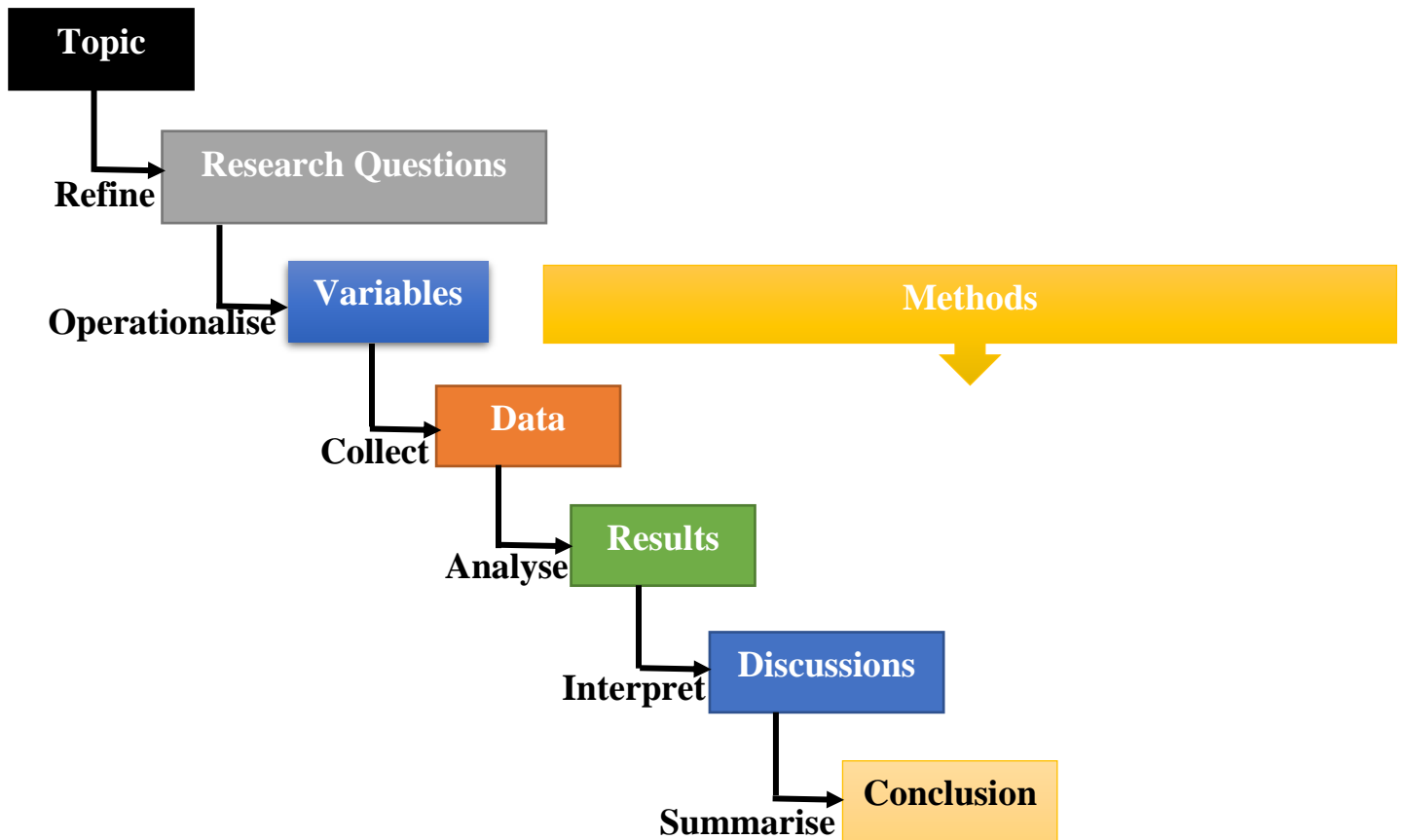
**Figure 3.1:** **Flowchart of Research Process**
Source: Sahu (2013)

## 3.3 Research Design

A research design is a detailed outline of how an investigation will take place. Through a research design, a researcher can decide to communicate the decisions regarding what study the design proposed to be used, how the information would be collected from the respondents, how respondents would be selected, how the collected information would be analysed and how the findings would be communicated (Kumar, 2011). A semi-structured interview is a method of research with a rigorous set of questions which does not allow one to divert. A semi-structured interview is open, allowing new ideas to be brought up during the interview as a result of what the interviewee says. The interviewer in a semi-structured interview generally has a framework of themes to be explored (Dawson, 2007).

In order to assess the usage of e-Government systems in Zambia, quantitative and qualitative design methods were used. The qualitative approach relied on semi-structured and non-numerical

data. The data took the form of field notes written in the course of interviews. In terms of design, a survey method was used. The qualitative design method was suitable for this research because it enabled the author to interview and investigate the target group to get the information that was required for the research. The quantitative approach enabled the researcher to get data presented using bar charts and frequencies to illustrate and supplement data that was derived from a qualitative approach. This design enabled the researcher to use a questionnaire to get the required data. Dawson (2007) states that "the process of measurement is central to quantitative research because it provides the fundamental connection between empirical observation and mathematical expression of quantitative relationships. Statistics is the widely used branch of mathematics in quantitative research".

## 3.4    Study Population

The total workforce of government employees in Lusaka is about 59,000. The population for the study comprised government employees who use e-Government system from all the government line ministries and institutions and were trained in the utilisation of the IS under study.  Authority was sought from Smart Zambia Institute (SZI) to conduct a survey in the line ministries in Lusaka. SZI provided a list of government employees who received initial training in IS. A list comprised of officers from all the 30 line ministries in Lusaka. A total of 150 e-mails of government employees was provided. It was from this list of government employees a sample population for the study was purposively selected.

## 3.5    Research Sample Size

Sampling is the process of selecting a small sample from the sample population to be the basis for forecasting the occurrence of unspecified information, situation or outcome regarding a larger group. A sample is a subcategory of the population a researcher could be interested in. This process of choosing a sample from the total population has pros and cons. The pros are that it is economical and serves time, the cons are that the researcher cannot discover the information about the population's qualities of interest but only approximate them. Consequently, the likelihood of an error in the estimation exists (Kumar, 2011).

In order to ensure that the selected candidates would help to provide information that was required to answer research questions and meet the research objectives, a list of 150 email addresses was

scrutinised to exclude employees who are located outside Lusaka. A list was reduced to 120 e-mail addresses. A sample size of 120 was sufficient based on the findings of Iivari (2005) who carried out a similar study in Finland, his sample size was 100 respondents who were selected from the 7,500 employees. In addition, Wang and Liao (2008) measured the success of G2C e-Government systems from the citizen's perspective. Structural equation modelling techniques were applied to data collected by questionnaire from 119 users of G2C e-Government systems in Taiwan.

The research sample size for this study was 120 experts selected as respondents for the structured questionnaire, drawn from 30 line ministries. The following criteria were used to determine the sample's participants. Firstly, information system application should have been deployed in the government institutions. Secondly, employees should be directly using an information system application in their work such as IFMIS, MS Outlook, Skype for Business and Share Point. Thirdly, employees should be drawn from different levels of management and were trained in IS. The study selected the study's subjects from these 3 items using a purposive method. Fifteen (15) interviews were conducted, five (5) ICT experts at Smart Zambia Institute and ten (10) other professionals were interviewed from other selected government institutions.

## 3.6    Sampling Techniques

Purposive sampling is a form of non-probability sampling in which researchers rely on their own judgment when choosing members of the population to participate in their study. This sampling method requires researchers to have prior knowledge about the purpose of their studies so that they can properly choose and approach eligible participants. Researchers use purposive sampling when they want to access a particular subset of people, as all participants of a study are selected because they fit a particular profile (Dawson, 2007).

Purposive sampling was used in this study to collect data from the target audience that were seen as best to provide information that was required to answer research questions and meet the research objectives.  Purposive sampling was used in the study because it is convenient and economic and beneficial to pilot studies.

A sample of 120 employees was based on selecting at least 4 government employees in each 30 government institutions in Lusaka. The study excluded government employees located outside

Lusaka. The study included in the survey government employees using IFMIS such as accountants and those that were trained in MS Outlook, Skype for Business and Share Point.

## 3.7    Instruments Used in Data Collection

### 3.7.1 Questionnaires

A self-administered questionnaire using e-Government Systems Assessment model information system's constructs were used to collect data from the government employees. The questionnaire was distributed online, with the application of Google Drive. The study chose to use an online questionnaire because it is a cheaper, efficient and effective way of collecting data compared to a paper-based questionnaire. The questionnaire was administered to various categories of government workers. Open-ended and closed questions were asked so as to get information for both qualitative and quantitative data respectively. The respondents that were of interest were any government employee in Lusaka who use e-Government systems. The target group filled in the form and submitted it online. In all, 120 questionnaires were distributed, however, only 90 copies were retrieved, giving a response rate of 75%. The data was found fit for data analysis.

### 3.7.2. Semi-structured interview guides

The semi-structured technique was used to get detailed information from the respondents. The guide helped the research to relate with respondents which made them give valid and detailed raw data. Semi-structured interviews were conducted with various officers from selected ministries and institutions. Purposive sampling was similarly used to select candidates for interviews. The study purposively selected cross-sectional ministries and institutions officers for interviews from 15 government institutions. This procedure was picked so that detailed information could be derived from the users of the e-Government systems.

## 3.8    Data Analysis and Timeline

The raw data which was collected from the field was analysed in various ways according to the type of data in question. Quantitative data was, however, analysed using a statistical package SPSS such as descriptive statistics, factor analysis and reliability analysis. Excel was also used for pivotal tables and graphical presentations. Qualitative data was collected using semi-structured interviews.

Qualitative data was analysed and presented in prose since it was largely descriptive in nature. The data analysis was based on 90 respondents.

### 3.9 Validity and Reliability of the Instruments

Reliability and validity are vital facets of selecting an instrument of the survey. Reliability refers to the degree that the instrument produces the same results over numerous trials**.** Validity refers to the degree that the instrument measures that which it was designed to measure (Kumar, 2011). A questionnaire is one of the most used instrument to collect data. The main objective of a questionnaire in research is to acquire pertinent information in the most reliable and valid approach. Hence, the accuracy and consistency of a questionnaire survey form an important aspect of research methodology which are known as validity and reliability (Taherdoost, 2018).

In quantitative research, an instrument that is often used is in the form of a questionnaire. To test the validity of the questionnaire, it was pilot tested using 5 respondents. The respondents on whom a test was run gave feedbacks which allowed the study to correct the questionnaire where it was necessary. A test was done on 3 occasions, a final test ran smoothly and finally, the questionnaire was distributed to the 120 respondents.

### 3.10 Data Analysis Instruments and Procedures Used

### 3.10.1 Quantitative Data Analysis Techniques

Dawson (2007) states that many researchers have used quantitative data analysis with SPSS software to obtain a greater understanding of the collected data. The advantage of analysing quantitative data using SPSS is that it permits several statistical analysis and data management tasks to be taken on with ease which can probably be more difficult to perform manually. Quantitative data analysis with SPSS further allows for far more irrefutable results than could be given without the software because it provides various options for computation, plus the sometimes complex cross-tabulation (Analysis.com, 2019). Quantitative Data Analysis Techniques which were used are;

a) ***Descriptive Statistics*** *(frequencies, proportions and percentages)*
   Frequency distribution helps a researcher to understand the frequency of the values being observed. A researcher can utilise the measures of central tendency and distribution to

understand the data. The three measures of central tendency are the Mean, median and mode (Li, 2013).

**b)** **_Cross-Tabulation_**

Cross-tabulation is also called Pivot Table in Excel, is the widely used technique for data analysis. It assists researchers to learn more about what the relations are among different variables. A researcher for example can see the ratings from female respondents and the ratings from male respondents (Li, 2013).

**c)** **_Frequency Distribution_**

Frequency distribution is a type of data analysis technique which permits a researcher to get an overview of the data. Using frequency distribution, a researcher can view how frequently the particular values are observed and what their percentages are for the same variable (Li, 2013).

**d)** **_Reliability Analysis_**

Reliability refers to whether a researcher gets the same response by using an instrument to measure something severally. Reliability is the extent to which a research method produces consistent and stable results. Cronbach's alpha is the most commonly used technique to test the reliability of a survey. Reliability test is used to assess the internal stability of a questionnaire which is made up of multiple Likert scales and items. It suggests how well a test measures what it should (Analysis.com, 2019).

Cronbach's alpha was developed by Lee Cronbach in 1951 measures reliability or internal consistency. Cronbach's alpha tests check if multiple question Likert scale surveys are reliable. These questions measure underlying variables hidden or unobservable variables such as a person's honesty, conscientiousness or obsession. Cronbach's alpha lets a researcher know whether the designed tests are accurately measuring the variable of interest (Center, nd).

**e)** **_Correlations_**

Correlations are used when an investigator needs to know the relationship between 2 variables. The correlation coefficient ranges in value from −1.0 to +1.0. The closer

correlation coefficient gets to -1.0 or 1.0, the stronger the correlation. The closer a correlations coefficient get to zero, the weaker the correlations are between the 2 variables. For the Pearson correlation used in this study, an absolute value of 1 indicates a perfect linear relationship. A correlation close to 0 indicates no linear relationship between the variables (Center, nd).

*f)*     *Validity*

Validity is important since it defines survey questions that can be used. It also assists in making sure that researchers are utilising questions that indeed measure the issues of significance. The validity of a survey is the extent to which it measures what it agrees to measure (Li, 2013).

*g)*     *Weighted Average*

An average is an incredible way to get an overview of the picture in the data. A sample is an accurate and evenly weighted representation of the population. An average account for the fact that the population is not even weighted. This is the actual goal of weighted averages. They account for differences weights in the sample. A weighted average which is used to more accurately portray a sample in relation to a population. There are certain instances in statistics where some data points contribute more "weight" than others. A researcher may also need to use it in order to account for outliers or variances. The weighted average is a means to account for disparities in the data (Center, no date). In this study, a weighted average was calculated using SPSS by using the compute variables function.

*h)*     *Text Analytics*

There are always open questions in the survey which permit respondent to complete their own answers. Open ended questions in a survey allow respondents to answer in an open text format so that they can respond based on their thorough knowledge, understanding and feeling. This means that answers to the questions are not restricted to a set of choices.

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In this study, open-ended questions allowed to investigate deep into the respondents' answers, this helped the research to gain valuable information about the subject matter at hand. The responses to these questions were used to get detailed and descriptive information on a subject which were summarised according to the thematic areas and presented in the qualitative section of the analysis.

### i)    *Factor Analysis*

Factor analysis is an approach to reduce the data in many variables into just a few variables. A researcher can condense the "dimensions" of the data into one or more 'super variables.' The widest used technique is Principal Component Analysis (PCA). The objective of factor analysis is to model the interrelationships among variables. Factor analysis' aims at reducing the number of variables in order to explain and interpret results from the survey (Center, nd).

### j)    *Kaiser Meyer Olkin and Bartlett's Test*

The Kaiser Meyer Olkin (KMO) measures the sampling adequacy, this test decides if the responses given with the sample are adequate or not, which should be close to 0.5 for acceptable factor analysis to continue. Bartlett's test is another indication of the strength of the relationship among variables (IBM Support, 2018).

### 3.10.2  Qualitative Data Analysis Techniques

In this study, semi-structured interviews were considered for guided interviews. The interviews were open-ended such that they allowed new ideas to crop up because of what the interviewee said. The study in this analysis technique had a framework of themes to be explored.

A content analysis technique was used to collect data. Dawson (2007) states that 'Using this method, the researcher systematically works through each transcript assigning codes, which may be numbers or words, to specific characteristics within the text. The researcher may already have a list of categories or may read through each transcript and let the categories emerge from the data.

An interview guide that outlined the interview questions was prepared as shown in Appendix A.

## 3.11 Ethical Considerations

The study used the University of Zambia (UNZA) guidelines as stipulated in the Directorate of Research and Graduate Studies (DRGS) guidelines. Clearance to conduct this research was obtained from the UNZA Ethics Committee that provided a letter of approval for the study. Throughout the research process, the study observed the ethical considerations by respecting the rights and views of the participants.

The study also sought permission from the e-Government coordinating unit in Cabinet Office to conduct interviews, distribute an online questionnaire and assess information that relate to e-Government in Zambia. Respondents' names were not revealed which was an indication of high confidentiality. They remained anonymous since the information they provided was strictly for academic purposes.

## 3.12 Summary

This chapter presented research methodologies whose purpose was to describe the plan used in collecting the relevant evidence in order to achieve the objectives. The researcher discussed the target population and the expected outputs of the data collection instruments. The following chapter discusses and analyses the collected results.

# CHAPTER 4: DATA ANALYSIS AND DISCUSSION OF RESULTS

## 4.1    Introduction

The previous chapter described the research methodology that was presented in the study. This chapter discusses the presentation of the results collected from the field. The study applied semi-structured interviews and a questionnaire survey to collect primary data. Utilising a combination of the methods such as quantitative and qualitative made the research more reliable and useful. The use of the questionnaire facilitated the collection of large amounts of data from a small population in an economical manner. Semi-structured interviews allowed the collection of qualitative information. This chapter includes results in form of bar charts, pie charts and tables.

## 4.2    Results from Interview

### 4.2.1   Introduction

The target group for the semi-structured interviews was five (5) people from SMART Zambia and (ten) (10) from the line ministries. However only seven (7) people were interviewed, each from a different ministry and five (5) from SZI to bring a total number of interviewees to twelve (12). The interviewees were drawn from the following ministries; Ministry of Commerce and Industry, Ministry of Finance, Cabinet Office, Office of the Auditor-General, Office of the Vice President, Ministry of Local Government and Ministry of Lands. The respondents were drawn from all levels of management such as senior, middle and junior management.

The interviews took place in various locations, that is, interviewees were followed to their workplaces after making appointments with them. Future interviews could be done using the technology brought about e-Government such as skype for business. Some interviews were conducted with minimal disturbances whilst others took long because of distractions during the interviews.

### 4.2.2   Analysing Qualitative Data

An interview summary form was used to analyse qualitative data. The form was completed during the interview. The form included practical details about the place, the participants, and details about the interview contents.  The form helped to remind about the contact and were useful when analysing the data, it also helped to keep the details of the interviewees.

The interview discussion guide is presented in Appendix II.

### 4.2.3 Interview Topics

The purpose of the interviews was to identify and understand perceptions, feelings and know what government employees think about e-Government systems. The interview questions were semi-structured and were both closed and open-ended to allow the study extract as much information as possible. Below is a summary of the interview findings.

**a) e-Government systems Performance in terms of System and Information Quality**

In general, study participants interviewed were happy with the user-friendliness of the e-Government systems. As the government transforms the way it does business mainly by bringing in new technologies, the systems that are being procured should be usable or user friendly. It is important to address this for the success of any change. Good usability can improve an e-Government system and increases the chances of a successful adoption.

Participants stated that the use of e-Government systems provide desired services such as IFMIS, a budgeting and accounting system that manages spending and payment processing. During the interviews, 9 out of 12 respondents said that IFMIS improved the provision of services to its employees and public whilst 11 out of 12 mentioned that Microsoft Outlook was user friendly and provided desired services. However, 7 out of 12 and 9 out of 12 participants were dissatisfied with Skype for Business and Share Point respectively. Other desired services mostly mentioned in the interviews were e-Payslip, Government Wide Area Network (GWAN), e-Cabinet, Internet Services among others. These services had resulted in a totally new way of doing business for the Zambia Public Service.

Information quality is the output of an e-Government system. Despite the deployment of ICT Shared Services by Government through SMART Zambia such as Skype for Business and Share Point, 7 out of 12 and 9 out of 12 interviewees respectively observed that the utilization of these shared services were below the expected levels. However, the individuals that use IFMIS strongly agreed that it provides accurate, reliable and sufficient information.

In terms of provision of quality services by information system providers, 6 out of 12 participants mentioned the following services as being quality: Ministerial Websites; IFMIS; Skype for

business; e-Payslip; Share Point; Internet Services; Government e-mail/Outlook; and e- Cabinet System. Despite Share Point and Skype for Business being underutilized, 5 out of 12 participants felt that they were critical for the success of the organisations.

**b) Service Quality from Information Systems Providers and Readiness of Personnel in the Use of e-Government Systems**

According to 11 out of 12 and 9 out of 12 participants, Microsoft Outlook and IFMIS respectively were services that were delivered successfully by IS providers. In terms of the systems being secure and protecting privacy, participants had divergent views, 5 out of 12 participants expressed doubts regarding the provision of security and privacy.

All the participants twelve (12) in total stated that ICT staff were an important link to government employees and consequently their performance was critical to the perceptions of service quality. In order to ensure that ICT staff perform well, there is a need to continuously give them credible training so that they understand how to perform their duties with diligence.

**c) Behaviours and Attitudes of Users regarding Dependency on the e-Government System and Frequency of System Use**

Participants were asked to mention the e-Government systems which they frequently use. The most mentioned services were Internet services from 12 out of 12 participants, government e-Mail Outlook, and e-Payslip from 11 out of 12 participants. The interviews discussed the services available in the institutions which were only used by designated people such as e-Cabinet, Zambia Integrated Agriculture Management Information System (ZIAMIS), and IFMIS. During the interviews, 7 out of 12 and 9 out of 12 participants said that Share Point and Skype for Business respectively, frequency of use was low due to lack of capacity in the utilization as well as lack of training.

The dependable services that were mostly mentioned in the interviews were IFMIS by 9 out of 12 participants, Internet Services 12 out of 12 participants, Government Wide Area Network (GWAN) 11 out of 12 participants, Microsoft Office Applications 12 out of 12 participants, e-Government Website 8 out of 12 participants. Zambia Integrated Agriculture Management Information System (ZIAMIS) and Zambia Integrated Land Management Information System

(ZILMIS) were all rated below 6 out of 12. These services would halt the institutional operations if they became malfunctional.

**d) e-Government systems contribute to the success of individual employee**

The study showed that awareness of services such as government email Microsoft Outlook and IFMIS was high in the government and were rated 12 out of 12, and 11 out 12 respectively. However, employees needed to be aware and be trained in Skype for business and Share Point. The implementation of e-Government resulted in a totally new way of doing business in the government. Service delivery has become more friendly, convenient, transparent, efficient and cost-effective using systems such as IFMIS, e-Payslip, GWAN among others. However, 10 out of 12 participants mentioned some problems in the operation of e-Government systems for example; connection issues, lack of technical support from SMART Zambia Institute, lack of computers, lack of training, lack of change management from SMART Zambia Institute. They further said that some services were not utilised because they were not fully adopted by line ministries.

**e) Government employees' general satisfaction with the e-Government applications**

On the overall, 10 out of 12 participants were satisfied with the government email (Microsoft Outlook) and 9 out of 12 were satisfied with IFMIS, they thought that these services were of high quality. However, in as much as Skype for Business and Share Point were of high quality, these services were appreciated by 4 out of 12 people on average. This was because orientation on these services was not adequately done.

It was observed during the interviews that, delivering an acceptable level of quality services in the government meant knowing who the stakeholders were, in this case, government employees, understanding what their needs were and meeting those needs, both now and in the future. 10 out of 12 participants mentioned that quality was about achieving great results and taking advantage of chances to show signs of improvements and better. Quality needs to be implored on delivering services so that utilization is maximised.

SMART Zambia Institute needed to provide the knowledge, tools and guidance to help ICT personnel and system users to play their part in determining and achieving the required level of quality.

**f) Challenges brought by e-Government Systems**

Some respondents interviewed specifically 4 out of 12 said that e-Government systems had cut the privileges that they had before the systems were implemented. For example, officers used to travel to various provinces to deliver payslips and earn an allowance out of that. Some felt that the technologies brought about e-Government required extra skills and hence lacked financial resources to sponsor themselves to learn certain skills.

### 4.2.4 Summary on Interviews

The interviews revealed that utilization of services such as e-Payslip and Microsoft Outlook were high because the government stopped issuing hard copies of payslips instead sends soft copies through individual e-Mails. With the coming of e-Government, the utilization of the internet increased because most systems and services required the internet to run. The government e-Mail outlook is a Microsoft 360 technologies running on the cloud, this requires internet services. The interview recorded 9 out of 12 interviewees who mentioned the importance of IFMIS in their institutions.

The results acquired from the interviews confirm the findings from the questionnaire about the government e-Mail service (Outlook) being the widest used application among government employees. The other findings from the interviews were that there is a decent number of services and systems that have been implemented but only known by the coordinating agency SZI and implementing agency, in this case, an institution using the service or system. These critical e-Government systems and services need to be assessed to establish their utilization.

### 4.3 Questionnaire and Data Analysis

The study was conducted using primary data. The primary data was collected through a questionnaire which was developed on the basis of an extensive literature review of Stefanovic *et al.* (2016), Nwone (2014), Urbach and Benjamin (2012), Idoughi and Abdelhakim (2018). The Government employees in the line ministries in Lusaka were targeted to respond to the survey questionnaire.

The questionnaire was divided into seven (7) sections. Section (A) was about demographic characteristics which included the date the respondents answered the questionnaire, age in years,

gender, qualifications, years in work experience, institutions and job position of the government employee.

Section (B) collected information on the technical system quality of an e-Government system which represents the performance of the system in terms of system quality.

Section (C) captured how users viewed information quality of e-Government services as the quality of contents provided by these e-services in terms of accuracy, sufficiency, precision, reliable information as well as the relevance of information when using the e-Government systems.

Section (D) was service quality which measured the gap between the people's expectations and the quality of the actually received service. The variables used to measure service quality were; security and privacy, availability of services, responsiveness, empathy and assurance.

Section (E) captured use/intention to use which is the extent and manner in which employees utilize the functions of an e-Government system. This dimension measured the behaviour and attitude of users in regard to the dependency and frequency of use of e-Government systems by the government employees.

Section (F) was about change management, it measures the acceptance and utilization of the e-Government systems. In this section, the variables used to measure change management were: awareness; training; and ability.

Finally, Section (G) was the extent to which the e-Government systems added value to the success of individual employees. It measured the government employees' satisfaction with the e-Government systems. The variables used were: satisfaction; meeting users' expectations; and high-quality systems. A full questionnaire can be seen in Appendix B.

### 4.3.1 Demographic Characteristics

Frequency distribution was used to assess the number of people in the survey aged in a particular category, the number of people that belonged to a specific gender, the number of people that possessed a certain qualification and how many belonged to a particular group of management position.

## a)      Gender

Figure 4.1 represents the number of respondents by gender. Out of 90 respondents, 54 were male representing 60% and 36 were female representing 40%.
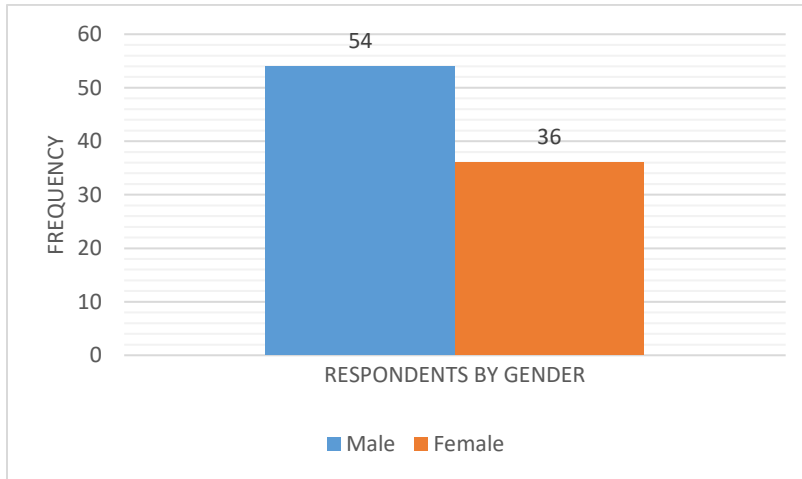


*Figure 4.1:        Respondents by Gender*

## b)      Positions By Category

Figure 4.2 displays a number of respondents by positions. Most of the respondents at 42.2% belonged to Middle Management.
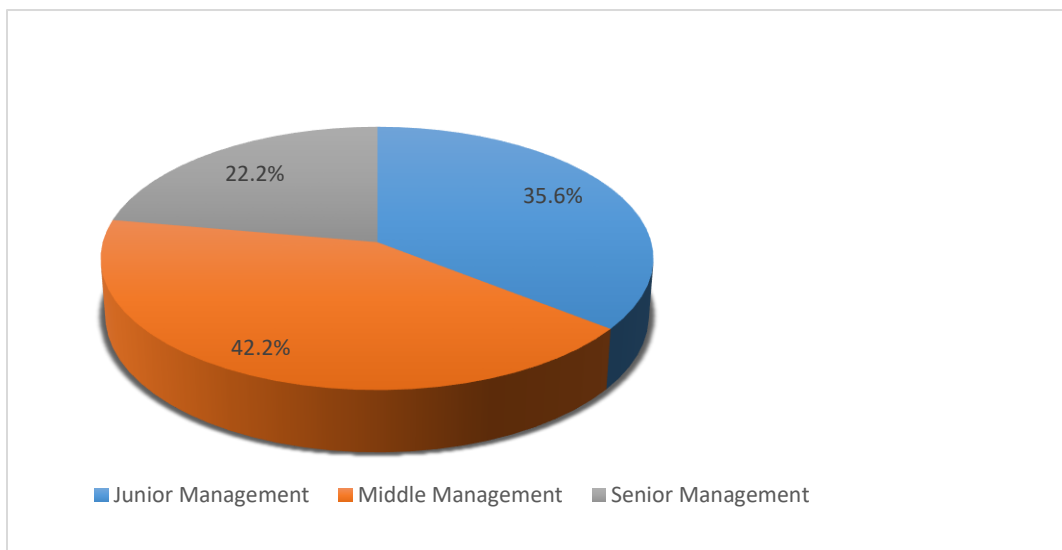


*Figure 4.2:        Percentage breakdown by Designation*

**c)   Highest Level of Education**

Figure 4.3 shows distribution of respondents in regard to levels of academic qualification. The respondents were required to indicate their highest level of education.
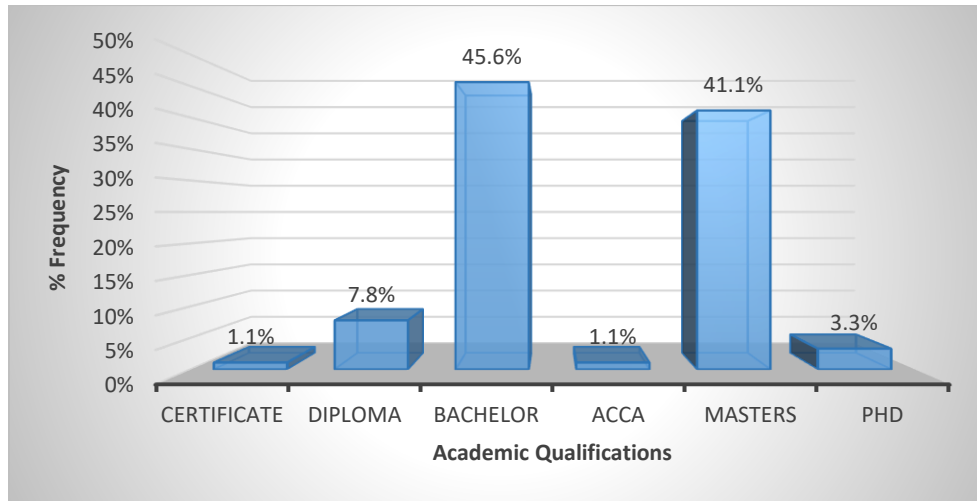


*Figure 4.3:     Percentage breakdown by respondent's academic qualification*

The majority at 45.6% had a bachelor's degree and 41.1% had master's degree qualifications. It can be observed from the statistics that the aspect of comprehension among respondents was acceptable.

**d)   Years of Work Experience**

Another characteristic used to categorise the respondents was the years of experience in the government. Figure 4.4 shows the distribution of the respondents in terms of years of experience. Most of the respondents at 61.1% had over 12 years experience whilst 18.9% had 9 to 11 work experience and 11.1% had 6 to 8 work experience, finally, the lowest at 8.9% had 3 to 5 work experience.
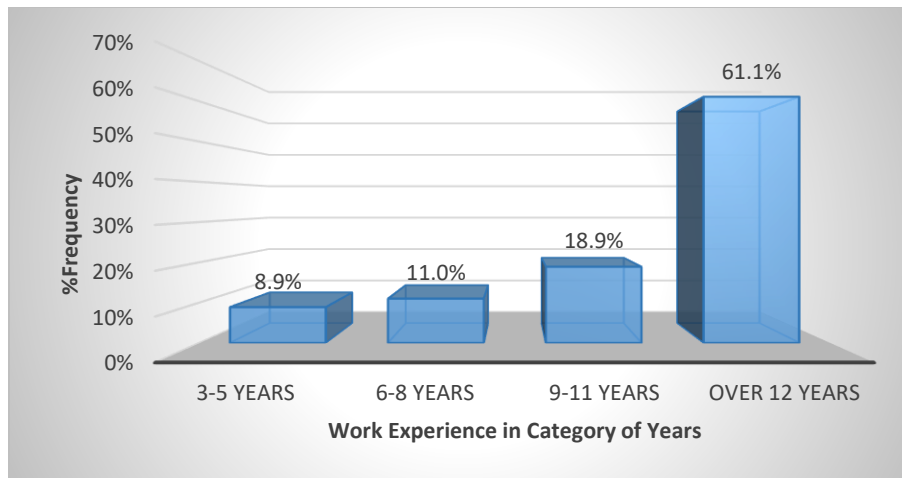
*Figure 4.4:*        *Years of Work Experience*

## e)        Age Group

The majority of the respondents in Figure 4.5 shows that 42.2% were aged between 35 and 44 whereas 38.9% were aged between 45 and 54. The graph also shows that12.2% were aged between 25 and 34 while 5.6% were aged between 55 and 64. Only 1.1% were aged between 18 and 24.
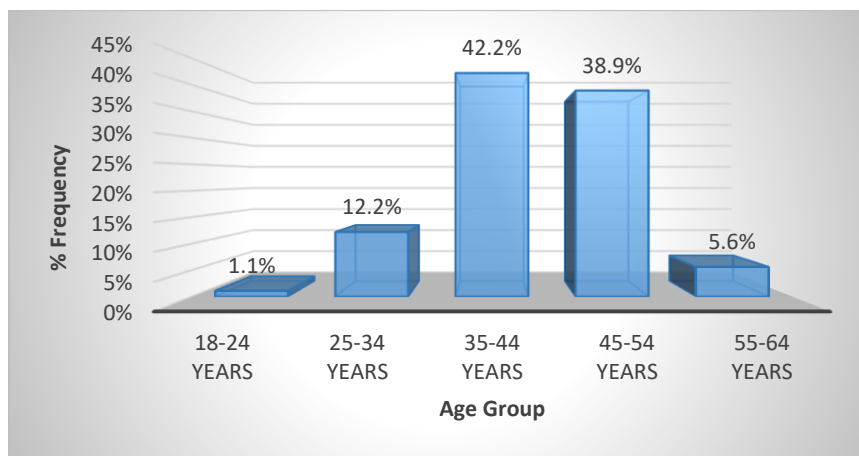


*Figure 4.5:*        *Age Group*

Table 4.1 summarises the demographic conditions of the study. The table shows the highest percentage at 61.1%, these were the respondents who had over 12 years' experience working in the government.  This gave the study confidence that information submitted by the respondents was reliable based on the experience.

**Table 4.1:**          **Summary of Demographic Conditions**

| Variables | Measurement | Frequency | Percent |
|---|---|---|---|
| Age | 18-24 | 1 | 1.1 |
| | 25-34 | 11 | 12.2 |
| | 35-44 | 38 | 42.2 |
| | 45-54 | 35 | 38.9 |
| | 55-64 | 5 | 5.6 |
| Gender | Male | 54 | 60 |
| | Female | 36 | 40 |
| Work Experience | 3.5 | 8 | 8.9 |
| | 6-8 | 10 | 11.1 |
| | 9-11 | 17 | 18.9 |
| | Over 12 Years | 55 | 61.1 |
| Management by Category | Junior Management | 32 | 35.6 |
| | Middle Management | 38 | 42.2 |
| | Senior Management | 20 | 22.2 |
| Highest Level of Education | Certificate | 1 | 1.1 |
| | Diploma | 7 | 7.8 |
| | Bachelor | 41 | 45.6 |
| | ACCA | 1 | 1.1 |
| | Masters | 37 | 41.1 |
| | PhD | 3 | 3.3 |

Responses from senior and middle managers indicate that the questionnaire was answered by respondents with more access to their organization information. Education qualification showed the majority had masters and bachelor's degrees. This means that the majority had enough basic knowledge and understood the topic that was discussed.

### 4.3.2   System Quality

This area of the survey focussed on how to measure the performance of the e-Government system quality in terms of usability. To measure system quality the Likert scale of 1 to 5 was used where:

**1 =Don't Know;  2 =Poor;  3 = Fair;  4 = Good;  5 = Excellent.**

### a)  Descriptive Analysis of System Quality

The study used descriptive analysis to understand the frequency of the values observed. Figure 4.6 shows the performance of e-Government systems quality in terms of usability. Microsoft Outlook was highly rated as good at 58.9% on 'user-friendliness' and 60% as good on 'desired services.

The lowest rated as good was Share Point at 27.8% for 'user-friendliness' and 31.1% for 'Desired Services'. This could mean that respondents felt that Share Point was not user friendly and they did not have the desire to use it. This may imply that they did not have the desire to use it perhaps they lacked knowledge on Share Point's functionalities and its purpose.
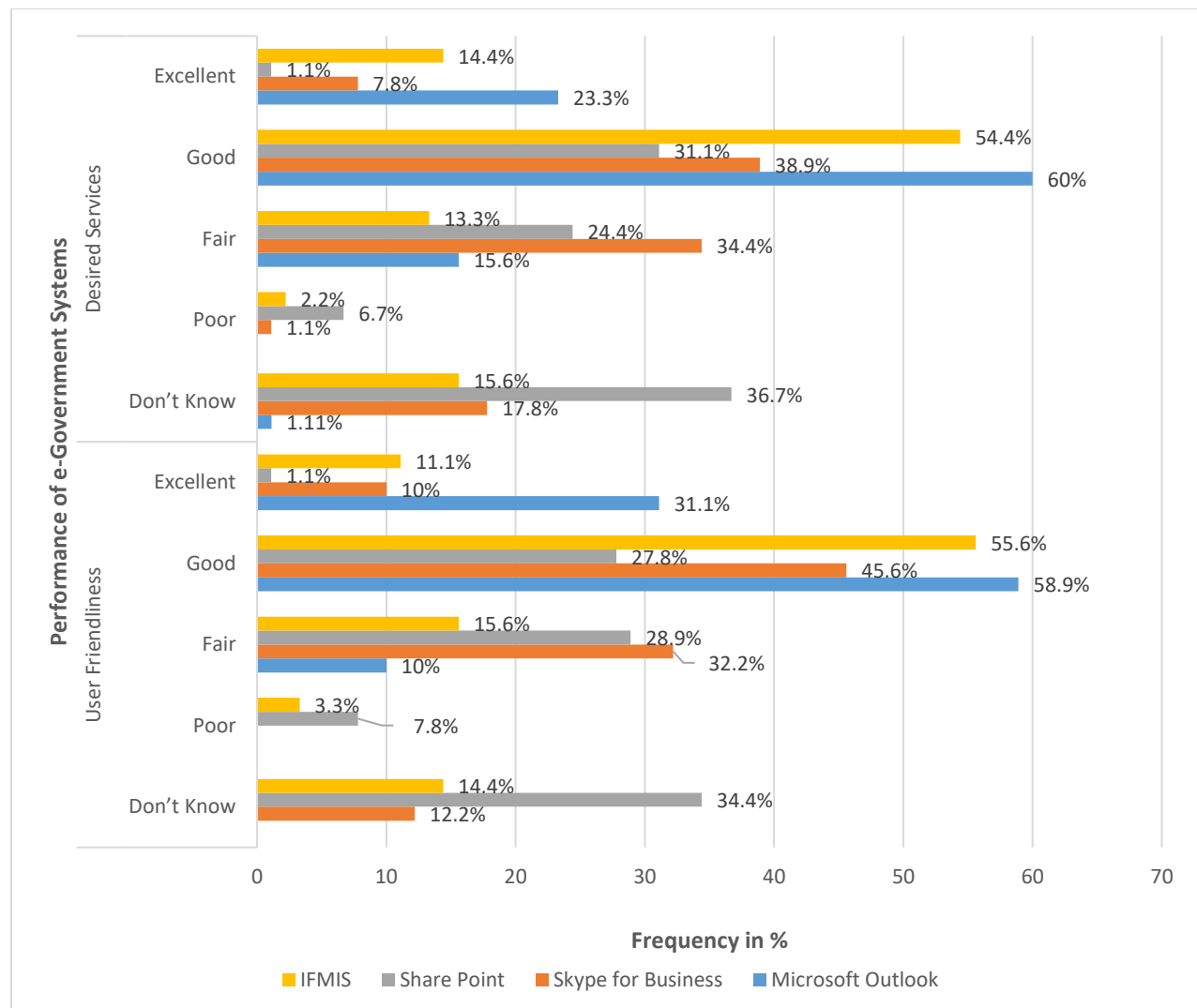


**Figure 4.6:** **Performance of e-Government System in Terms of Usability**

## b) Composite Scoring on System Quality

A composite scoring was done by computing user-friendliness and desired services to get a weighted average of an overall systems quality rating. A weighted average was required to account for the fact that the ratings from the respondents of the survey were not equally distributed amongst

the four e-Government systems that were measured. The scores were calculated by the mean of the items included in each domain as depicted in Figure 4.6.
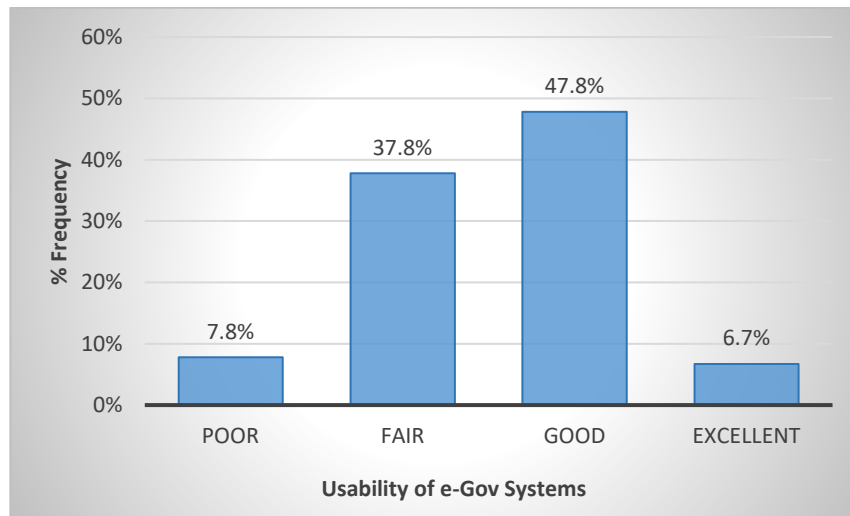


*Figure 4.7:*      *System Quality Rating*

The results as shown in Figure 4.7 indicate that performance of e-Government systems' quality was rated as 'good' at 47.8%, followed by 'fair' at 37.8%, 'poor' was rated at 7.8% and finally 'excellent' was rated at 6.7%.

Table 4.3 is a descriptive statistics table showing the minimum of the rating at 2 and maximum 5. After running the analysis by aggregating the variables to get the weighted average, it was found that '1' which was 'I don't Know' was dropped from the scale of $.1 - 5$. The study used a weighted-averaging technique to give data values closest to the forecasted values or estimated greater importance, or influence, as opposed to values further away.

The results in Table 4.2 has a Mean of 3.53 which was used to compare data sets from other dimensions of an e-Government Assessment model. Table 4.2 also shows that Standard Deviation was high at 0.737 or 74% indicating that the values were spread out over a wider range. This was because of variations in rating the e-Government systems' in terms of 'user-friendliness' and 'desire services'.

**Table 4.2:**   **System Quality Average Rating**

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Average Rating SQ | 90 | 2 | 5 | 3.53 | .737 |

## c) Reliability Analysis on Composite Variables

Reliability is the extent to which a research method produces consistent and stable results. High reliability meant that usability of e-Government system quality was measured, while low reliability means the measure was on something different. Table 4.3 is a rule of thumb for interpreting Cronbach alpha for the Likert scale.

**Table 4.3:**   **A Rule of Thumb for Interpreting Alpha for Likert scale;**

| Cronbach's alpha | Internal consistency |
|---|---|
| $\alpha \geq 0.9$ | Excellent |
| $0.9 > \alpha \geq 0.8$ | Good |
| $0.8 > \alpha \geq 0.7$ | Acceptable |
| $0.7 > \alpha \geq 0.6$ | Questionable |
| $0.6 > \alpha \geq 0.5$ | Poor |
| $0.5 > \alpha$ | Unacceptable |

Source:  (Center, no date)

The study needed to ensure that the questionnaire used in the study measures the usability of e-Government systems in a useful way. Table 4.4 shows the results of the reliability analysis on the two composite variables 'user-friendliness' and 'desired services' both measuring Systems Quality (SQ).

**Table 4.4:**   **Reliability Analysis on Two Composite Variables – System Quality**

| Cronbach's Alpha | Item Variables |
|---|---|
| 0.822 | 1.  User Friendliness <br> 2.  Desired Services |

As seen from Table 4.4, it was found that the subscale's alpha level was 0.822, which indicates that the subscale had an adequate level of inter-item reliability. This means that the two composite items were measuring the same thing that is Systems Quality (SQ).

## d) Systems Quality Validity Analysis

The intent of this test was to find out whether the questionnaire that was made about the system quality had acceptable variables. It was found that the "User-Friendliness" subscale was positively correlated with the "Desired Services" subscale, $r(df = 89) = 0.699$, $p < .01$. The correlation coefficient of 0.699 is very significant as shown in Table 4.5.

**Table 4.5:        Validity test on System Quality**

| Variables | | User Friendliness | Desired Services |
|---|---|---|---|
| **User Friendliness** | Pearson Correlation | 1 | 0.699** |
| | Sig. (2-tailed) | | .000 |
| | N | 90 | 90 |
| **Desired Services** | Pearson Correlation | 0.699** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 90 | 90 |

** Correlation is significant at the 0.01 level (2-tailed).

## e) Factor Analysis

### i)        *Descriptive Analysis on System Quality*

Results using descriptive statistics analysis on system quality are shown in Table 4.6. The mean values in the descriptive analysis in Table 4.6 conclude that respondents felt that Microsoft Outlook with Mean Value of 4.21 on 'user friendliness' and 4.04 on 'desired services' was the most important e-service that influences government workers to utilize the services. The next service was IFMIS with Mean Value of 3.50 on 'user friendliness' and 3.46 on 'desired services', then closely followed by Skype for Business having Mean Value of 3.41 and 3.18 and the lowest was Share Point with a Mean Value of 2.53.

**Table 4.6        Descriptive Analysis on System Quality**

| Measure | Mean | Std. Deviation | Analysis N |
|---|---|---|---|
| 1.    User-friendliness of Microsoft Outlook | 4.21 | 0.609 | 90 |
| 2.    Microsoft Outlook provide desired services | 4.04 | 0.702 | 90 |
| 3.    IFMIS provide desired services | 3.50 | 1.238 | 90 |
| 4.    User-friendliness of IFMIS | 3.46 | 1.191 | 90 |
| 5.    User-friendliness of Skype for Business | 3.41 | 1.090 | 90 |
| 6.    Skype for Business provide desired services | 3.18 | 1.186 | 90 |
| 7.    User-friendliness of Share Point | 2.53 | 1.256 | 90 |
| 8.    Share Point provide desired services | 2.53 | 1.300 | 90 |

**ii)** *The Correlation Matrix*

The correlation coefficient between a variable and itself is always 1 as shown in Table 4.7, hence the principal diagonal of the correlation matrix contains 1s. The correlation coefficient can range in value from −1.0 to +1.0. The closer correlation coefficients get to -1.0 or 1.0, the stronger the correlation. The closer a correlation coefficient gets to zero, the weaker the correlation is between the two variables. For the Pearson correlation used in this study, an absolute value of 1 indicates a perfect linear relationship. A correlation close to 0 indicates no linear relationship between the variables (Center, no date).

A positive correlation coefficient means that as variable 1 increase, variable 2 increases, and then again, as variable 1 decrease, variable 2 decreases. The variables move in the same direction when there is a positive correlation. A negative correlation means that as variable 1 increase, variable 2 decreases and vice versa. The variables move in opposite directions when there is a negative correlation (Center, no date).

As can be seen in Table 4.7, the lowest correlation is shown in column 2 and role 5 at .021 and the significant level was very weak at 0.846. These results describe the variables; '*user-friendliness of MS outlook*' and '*user friendliness of IFMIS*'. This means that the relationship between the two variables was weak or does not exist at all. The highest correlation in Table 4.7 is in column 4, role 8 reading 0.939 which has an acceptable significant level of .000. These results describe the variables; '*Share Point provide desired results*' and '*user-friendliness of Share Point*'. This means that the relationship between the two variables was very strong, and should be used in the study for further analysis. All the significantly correlated variables are highlighted as shown in Table 4.7.

Furthermore, Table 4.7, in column 3 and 4 has '*User-friendliness of skype for business*' and '*User-friendliness of SharePoin*t' correlated with '*MS Outlook provide desired results'* in role 6. The results show a negative correlation with figures reading -0.39 and -0.40, '*user-friendliness of share point'* and '*MS Outlook provide desired results*' correlated at -0.40. The negative sign indicates that, as class size increases, mean reading scores decrease.

In these results, some p-values for the correlation amongst variables were less than the significance level of 0.01, this indicates that the correlation coefficients were significant. The p-value amongst

other variables were greater than the significance level of 0.01, there was unproductive evidence about the importance of the relationship amongst these variables.

**Table 4.7:**     **Correlation Matrix – System Quality**

| | | User-friendliness of Microsoft Outlook | User-friendliness of Skype for Business | User-friendliness of Share Point | User-friendliness of IFMIS | Microsoft Outlook provide desired services | Skype for Business provide desired services | Share Point provide desired services | IFMIS provide desired services |
|---|---|---|---|---|---|---|---|---|---|
| User-friendliness of Microsoft Outlook | Pearson Correlation | 1 | .223* | .086 | .021 | .530** | .212* | .083 | .052 |
| | Sig. (2-tailed) | | .034 | .419 | .846 | .000 | .045 | .435 | .625 |
| | N | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| User-friendliness of Skype for Business | Pearson Correlation | .223* | 1 | .445** | .027 | -.039 | .795** | .430** | .071 |
| | Sig. (2-tailed) | .034 | | .000 | .799 | .716 | .000 | .000 | .508 |
| | N | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| User-friendliness of Share Point | Pearson Correlation | .086 | .445** | 1 | .256* | -.040 | .562** | .939** | .303** |
| | Sig. (2-tailed) | .419 | .000 | | .015 | .709 | .000 | .000 | .004 |
| | N | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| User-friendliness of IFMIS | Pearson Correlation | .021 | .027 | .256* | 1 | .016 | .061 | .255* | .849** |
| | Sig. (2-tailed) | .846 | .799 | .015 | | .882 | .566 | .015 | .000 |
| | N | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| Microsoft Outlook provide desired services | Pearson Correlation | .530** | -.039 | -.040 | .016 | 1 | .152 | .072 | .155 |
| | Sig. (2-tailed) | .000 | .716 | .709 | .882 | | .151 | .498 | .144 |
| | N | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| Skype for Business provide desired services | Pearson Correlation | .212* | .795** | .562** | .061 | .152 | 1 | .572** | .176 |
| | Sig. (2-tailed) | .045 | .000 | .000 | .566 | .151 | | .000 | .097 |
| | N | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| Share Point provide desired services | Pearson Correlation | .083 | .430** | .939** | .255* | .072 | .572** | 1 | .370** |
| | Sig. (2-tailed) | .435 | .000 | .000 | .015 | .498 | .000 | | .000 |
| | N | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| IFMIS provide desired services | Pearson Correlation | .052 | .071 | .303** | .849** | .155 | .176 | .370** | 1 |
| | Sig. (2-tailed) | .625 | .508 | .004 | .000 | .144 | .097 | .000 | |
| | N | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |

**iii)** *The Kaiser Meyer Olkin and Bartlett's Test*

The Kaiser Meyer Olkin (KMO) measures the sampling adequacy, it decides whether the responses given with the sample are adequate or not, which should be close to 0.5 for satisfactory factor analysis to continue. Bartlett's test is another indication of the strength of the relationship among variables (Support, 2018).

KMO values that are greater than 0.8 are acceptable, it means that factor analysis or a component will be useful for these variables. This occurs when a good number of zero-order correlations are positive values. KMO values less than 0.5 occur when most of the zero-order correlations are negative values. KMO values less than 0.5 require corrective action, either by including other variables related to the offenders or by deleting the offending variables (Support, 2018).

As shown in the KMO and Bartlett's Test table 4.8 the KMO value of .541 was obtained. This is significantly based on the 0.5 threshold (Support, 2018). From the KMO and Bartlett's Test table, the Bartlett's Test of Sphericity is significant ($<.01$) i.e. the significance is less than 0.05. This means that the significance level is small enough to reject the null hypothesis. The variables are significantly correlated.

**Table 4.8:      KMO and Bartlett's Test – System Quality**

| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | 0.541 |
|---|---|---|
| Bartlett's Test of Sphericity | Sig. | .000 |

**iv)** *Communalities*

Communalities is how much of the variance that is communality value which should be more than 0.5 to be considered for further analysis. Else, these variables ought to be removed from further enhancements of factor analysis in the variables that have been accounted for by the extracted factors (IBM Support, 2018). Table 4.9 shows the highest variance at 90% being "*extent IFMIS provides desired services*" is accounted for, while the lowest variance at 69.7% being "*User-friendliness of Skype for Business*" is accounted for. All the variables passed the threshold and were retained for further analysis.

**Table 4.9:**   **Communalities on System Quality**

| Items | Initial | Extraction |
|---|---|---|
| 1. IFMIS provide desired services | 1.000 | 0.904 |
| 2. User-friendliness of IFMIS | 1.000 | 0.881 |
| 3. User-friendliness of Share Point | 1.000 | 0.801 |
| 4. Skype for Business provide desired services | 1.000 | 0.794 |
| 5. Share Point provide desired services | 1.000 | 0.794 |
| 6. Microsoft Outlook provide desired services | 1.000 | 0.777 |
| 7. User-friendliness of Microsoft Outlook | 1.000 | 0.756 |
| 8. User-friendliness of Skype for Business | 1.000 | 0.697 |
| *Extraction Method: Principal Component Analysis.* | | |


### v)   *Choosing the Number of Components to Extract*

Principal Component Analysis's (PCA) goal is to reduce further a set of variables. PCA has a criterion for choosing components that have eigenvalues greater than 1. Table 4.10 shows that the first three components have an eigenvalue greater than 1.

Table 4.10 shows a Total Variance Explained which has 8 components in the rows. The rule is to have eigenvalue greater than one. The Extraction Sums of Squared Loadings section of this table only has 3 values. Based on the rule, SPSS retained 3 components. The 3 components, from this perspective, explains the relationships between item 1 through item 8. The 3-component solution accounted for 80% of the variance is indicated under the cumulative percentage.

**Table 4.10:**   **Total Variance Explained – System Quality**

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 3.181 | 39.763 | 39.763 | 3.181 | 39.763 | 39.763 |
| 2 | 1.713 | 21.413 | 61.176 | 1.713 | 21.413 | 61.176 |
| 3 | 1.511 | 18.887 | 80.063 | 1.511 | 18.887 | 80.063 |
| 4 | 0.774 | 9.672 | 89.735 | | | |
| 5 | 0.488 | 6.100 | 95.835 | | | |
| 6 | 0.155 | 1.940 | 97.775 | | | |
| 7 | 0.134 | 1.669 | 99.444 | | | |
| 8 | 0.044 | 0.556 | 100.000 | | | |
| *Extraction Method: Principal Component Analysis*. | | | | | | |

## vi)    *The Component Matrix*

Table 4.11 shows the extracted values of each item under three variables. These are loadings of the eight variables on the three factors extracted. The higher the total value of the loading, the more the factor contributes to the variable. Three variables were extracted in which the eight items were divided into three variables according to the most important items which had similar responses in component 1 and concurrently in component 2 and 3. The loadings that were less than 0.5 were not favourable.

The values in Table 4.11 could be interpreted in a PCA with a 3-component solution, these are literally just the Pearson correlation of the item with the component, for example, the highest loading on Table 4.11 was item 1 which correlates or loads 0.871 on component 1. The lowest loading on component 1 is item 8 which loads 0.164 on component 1. The highest loading on component 2 is item 7 which loads 0.822. Component 3 had item 8 which loads the highest at 0.864. Further analysis under the rotated component matrix was carried out.

**Table 4.11:        Component Matrix – System Quality**

|  |  | Component | | |
|---|---|---|---|---|
|  |  | **1** | **2** | **3** |
| 1 | Share Point provide desired services | 0.871 | -0.025 | -0.189 |
| 2 | User-friendliness of Share Point | 0.854 | -0.054 | -0.261 |
| 3 | Skype for Business provide desired services | 0.792 | -0.409 | -0.011 |
| 4 | User-friendliness of Skype for Business | 0.683 | -0.470 | -0.100 |
| 5 | IFMIS provide desired services | 0.546 | 0.766 | 0.144 |
| 6 | User-friendliness of IFMIS | 0.449 | 0.822 | 0.066 |
| 7 | User-friendliness of Microsoft Outlook | 0.271 | -0.238 | 0.791 |
| 8 | Microsoft Outlook provide desired services | 0.164 | -0.054 | 0.864 |
|  | *Extraction Method: Principal Component Analysis. A 3 Component Extraction* | | | |

## vii)    *The Rotated Component Matrix*

The goal of the rotated complex matrix is to reduce the number of factors on which the variables under investigation have high loadings. Essentially, rotation does not change the analysis but makes the interpretation simpler. The rotated component matrix helps to determine what the components signify (Center, no date).

Table 4.12 shows that the first component is most highly correlated with variables on items [6], [3], [7] and [2]. These variables are better representatives on component 1. Component 2 is most highly correlated with variables in item [4] and [8]. Component 3 is most highly correlated with variables in items [1] and [5]. This suggests that the study can focus on the following variables for further analysis;

i. Skype for Business provides desired services

ii. User-friendliness of IFMIS and

iii. Microsoft Outlook provides desired services

**Table 4.12:      Rotated Component Matrix – System Quality**

|  | Component | | |
|---|---|---|---|
|  | **1** | **2** | **3** |
| 1.   User-friendliness of Microsoft Outlook |  |  | 0.855 |
| 2.   User-friendliness of Skype for Business | 0.817 |  |  |
| 3.   User-friendliness of Share Point | 0.839 |  |  |
| 4.   User-friendliness of IFMIS |  | 0.937 |  |
| 5.   Microsoft Outlook provide desired services |  |  | 0.875 |
| 6.   Skype for Business provide desired services | 0.868 |  |  |
| 7.   Share Point provide desired services | 0.825 |  |  |
| 8.   IFMIS provide desired services |  | 0.936 |  |
| *Extraction Method: Principal Component Analysis.* | | | |
| *Rotation Method: Varimax with Kaiser Normalization.* | | | |
| *a. Rotation converged in 4 iterations.* | | | |

As stated earlier, the objective of factor analysis is to model the interrelationships among variables. Factor analysis' aim is to reduce the number of variables in order to explain and to interpret results from the survey (Center, no date). As observed from the above paragraph, the number of variables was reduced from 8 to 3. These variables are enough to represent a group as shown in Figure 4.8.
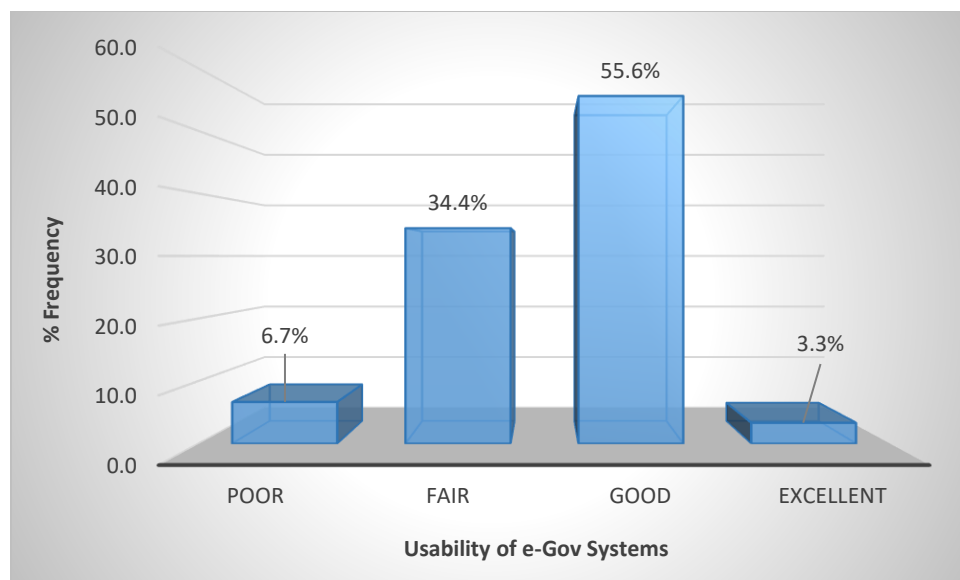
*Figure 4.8:*       *System Quality Rating – Factor Analysis*

As can be seen in Figure 4.8 and Table 4.13, the results on the 3 variables is almost the same as those obtained using 8 variables in Figure 4.7 and Table 4.2.

**Table 4.13:**       **System Quality Average Rating – Factor Analysis**

| Average Rating SQ | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
|  |  | 2 | 5 | 3.56 | 0.672 |

**f)   Summary on System Quality**

The items that were rated in the questionnaire had huge disparities amongst them that are Microsoft Office was rated highly as compared to Share Point. This prompted the study to use the weighted average method to analyse the data because some numbers counted more than others or carried more weight than others. The results from the weighted average analysis were compared with those from principal component analysis (PCA) and found that they were almost the same.

According to Kumar (2011) reliability refers to the extent that the instrument yields the same results over multiple trials. Validity refers to the extent that the instrument measures what it was designed to measure. From the above statement, it can be concluded that the instrument used in the study was reliable and that it measured system quality. It can also be concluded that the overall performance of system quality was rated as good at 55.6%.

### 4.3.3 Information Quality

The objective of this section was to measure the performance of the e-Government systems in terms of output. To measure information quality a Likert scale of 1 to 5 was used such as:

**1 =Yes;  2 =No;  3 = Maybe;  4 = I don't Know;  5 = Not Applicable.**

**a)  Descriptive Analysis of Information Quality**

The information quality dimension constituted the desirable characteristics of IFMIS's output, thus the information a government employee generates using IFMIS. Respondents were asked if IFMIS produces precise, accurate, sufficient and reliable information. Table 4.14 shows that 57.8% agreed that IFMIS information was precise and accurate while 47.8% and 56.7% said the information from the system is sufficient and reliable respectively. The 'not applicable' variable are those respondents who do not use IFMIS and they stood at a frequency of 15 respondents making 16.7% for both 'Precise' and 'Accurate' information. However, respondents who mentioned 'I don't know' were 10% and 8.9% for precise and accurate respectively. These respondents had no knowledge about e-Government systems. The respondent's descriptive statistics are shown in Table 4.14;

**Table 4.14:      Performance of e-Government System  in Terms of Output (Pivot Table)**

| Variables | Precise | | Accurate | | Sufficient | | Reliable | |
|---|---|---|---|---|---|---|---|---|
| | Number | % | Number | % | Number | % | Number | % |
| Yes | 52 | 57.8 | 52 | 57.8 | 43 | 47.8 | 51 | 56.7 |
| No | 3 | 3.3 | 2 | 2.2 | 9 | 10.0 | 3 | 3.3 |
| Maybe | 11 | 12.2 | 13 | 14.4 | 14 | 15.6 | 13 | 14.4 |
| I don't Know | 9 | 10.0 | 8 | 8.9 | 8 | 8.9 | 8 | 8.9 |
| Not Applicable | 15 | 16.7 | 15 | 16.7 | 16 | 17.8 | 15 | 16.7 |
| Total | 90 | | 90 | | 90 | | 90 | |

**b)  Information content of the e-Government system/services tailored to end user' needs**

Figure 4.9 shows the e-Government systems that fit user needs. Most of the respondents at 93.5% and 84.7% agreed that Microsoft Outlook and IFMIS met their needs respectively. Skype for business was rated at 62% whilst SharePoint came last at 41.3%.
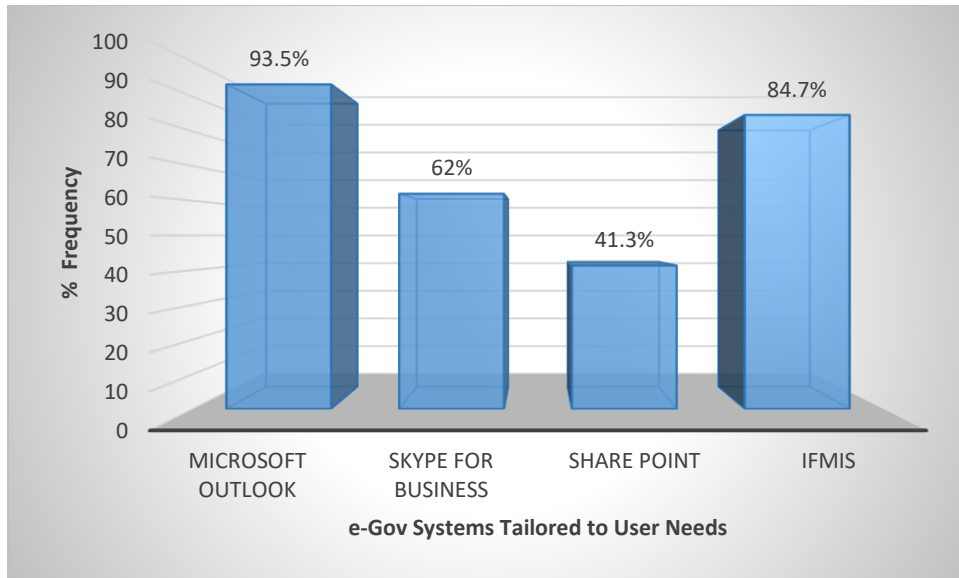
*Figure 4.9:      e-Government Systems that Fit User Needs*

## c)  Composite Scoring on Information Quality

A composite score was done by combining all the questions in information quality dimension to get a weighted average of an overall information quality rating. The scores were calculated by the mean of the items included in each domain. Table 4.15 is a descriptive statistics table showing the minimum of the rating at 1 and maximum 5, a mean value of 2.31 and a standard deviation of 1.563.

**Table 4.15:       Information Quality Average Rating**

|                   | N  | Minimum | Maximum | Mean | Std. Deviation |
|-------------------|----|---------|---------|------|----------------|
| Information Qty   | 90 | 1       | 5       | 2.31 | 1.563          |

Figure 4.10 illustrates that, on the overall, 51.1% agreed that the e-Government systems performed well in terms of output. However, IFMIS was not applicable to the 16.7% respondents.
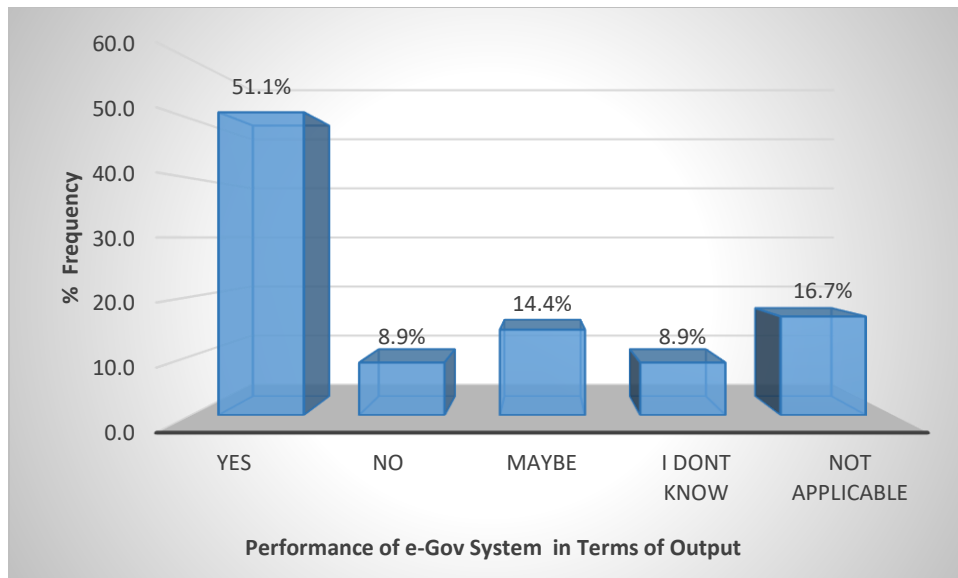
**Figure 4.10:** **Information Quality Rating**

## d) Reliability Analysis on Composite Variables

Table 4.16 shows the results of the reliability analysis on 4 composite variables namely; 'reliability', 'sufficient', 'precise' and 'accurate', all measuring information Quality (IQ). As can be seen from Table 4.16, it was found that the subscale's alpha level was 0.985, this meant that the subscale had an adequate level of inter-item reliability. This implies that the four composite items measured the same thing that is, Information Quality (IQ).

**Table 4.16:** **Reliability Statistics - Information Quality**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|---|---|---|
| 0.985 | 0.985 | 4 |

## e) Information Quality Validity Analysis

The intent of this test was to find out whether the questionnaire that was made about the information quality had acceptable variables. It was found that the "Accurate and Precise information" subscale was positively correlated with the "Sufficient and reliable information" subscale, $r(df = 89) = .959, p < .01$. The correlation coefficient of .959 is very significant as shown in Table 4.17.

**Table 4.17:          Validity test on Information Quality**

| | | Accurate and Precise Information | Sufficient and Reliable Information |
|---|---|---|---|
| Accurate and Precise Information | Pearson Correlation | 1 | 0.959** |
| | Sig. (2-tailed) | | .000 |
| | N | 90 | 90 |
| Sufficient and Reliable Information | Pearson Correlation | 0.959** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 90 | 90 |

**. Correlation is significant at the 0.01 level (2-tailed).

## f)  Factor Analysis

### i)       *Descriptive Statistics*

The mean values in the descriptive in Table 4.18 concludes that item 1 '*IFMIS provides sufficient information*' had a highest Mean Value of 2.39, however, it has the lowest standard deviation of 1.570.  Items 3 and 4 had a lowest mean 2.24 but with the highest standard deviation of 1.603 and 1.596 respectively. A standard deviation was used to determine how spread out the data were from the mean as can be seen in Table 4.18. A higher standard deviation value indicates greater spread in the data.

**Table 4.18:          Descriptive Statistics - Information Quality**

| | Variables | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|---|
| 1 | IFMIS system provides *sufficient* information | 90 | 1 | 5 | 2.39 | 1.570 |
| 2 | IFMIS system provides *reliable* information | 90 | 1 | 5 | 2.26 | 1.590 |
| 3 | IFMIS system provides *precise* information | 90 | 1 | 5 | 2.24 | 1.603 |
| 4 | IFMIS system provides *accurate* information | 90 | 1 | 5 | 2.24 | 1.596 |

### ii)      *The Correlation Matrix*

A positive correlation means that high scores on one side are associated with high scores on the other and that low scores on one side are associated with low scores on the other. A statistically

significant correlation is indicated by a probability value of less than 0.01 or 0.05. This means that the probability of obtaining such a correlation coefficient by chance is less than five times out of 100 (Desktop, no date).

The results in Table 4.19 indicate the presence of relationships. In these results, the p-values for the correlation between left and right in Table 4.19 are both less than the significance level of 0.01, which indicate that the correlation coefficients are significant. The larger the absolute value of the coefficient, the stronger the relationship between the variables. The results in Table 4.19 also show that the correlation coefficients are very close to 1.0, this means that the correlation amongst the variables are strong.

**Table 4.19:** **Inter-Item Correlation Matrix – Information Quality**

| | | IFMIS system provides precise information | IFMIS system provides accurate information | IFMIS system provides sufficient information | IFMIS system provides reliable information |
|---|---|---|---|---|---|
| IFMIS system provides precise information | Pearson Correlation | 1 | .965** | .891** | .967** |
| | Sig. (2-tailed) | | .000 | .000 | .000 |
| | N | 90 | 90 | 90 | 90 |
| IFMIS system provides accurate information | Pearson Correlation | .965** | 1 | .917** | .993** |
| | Sig. (2-tailed) | .000 | | .000 | .000 |
| | N | 90 | 90 | 90 | 90 |
| IFMIS system provides sufficient information | Pearson Correlation | .891** | .917** | 1 | .914** |
| | Sig. (2-tailed) | .000 | .000 | | .000 |
| | N | 90 | 90 | 90 | 90 |
| IFMIS system provides reliable information | Pearson Correlation | .967** | .993** | .914** | 1 |
| | Sig. (2-tailed) | .000 | .000 | .000 | |
| | N | 90 | 90 | 90 | 90 |
| **. Correlation is significant at the 0.01 level (2-tailed). | | | | | |

### iii) *The KMO and Bartlett's Test*

For information quality dimension, the responses given with the sample were adequate because there was more than a threshold of 0.5 for satisfactory factor analysis to continue. Bartlett's test is another indication of the strength of the relationship among variables (Support, 2018).

As shown in the KMO and Bartlett's Test Table 4.20 the KMO value of .855 was obtained. This was significantly based on the 0.5 thresholds. From the KMO and Bartlett's Test Table, Bartlett's Test of Sphericity was significant ($<.01$) that is the significance was less than 0.05. This implies that the significance level was small enough to reject the null hypothesis, meaning that the correlation matrix is not an identity matrix. The variables were significantly correlated.

**Table 4.20:       The KMO and Bartlett's Test – Information Quality**

| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .0855 |
|---|---|---|
| Bartlett's Test of Sphericity | Sig. | .000 |

In conclusion, the study observed the importance of validity, it was essential since it defined survey questions that were used. It also assisted in making sure that the study utilised questions that indeed measured the issues of significance that is information quality. The validity of a survey was the extent to which it measured what the study planned to measure. The questions used in this dimension of the study measured information quality. PCA test was not conducted for information quality dimension since the variables were quite few.

### 4.3.4   Service Quality

This area of the survey focussed on measuring the readiness of personnel in the use of e-Government systems. The general quality of services that users of e-Government systems receive from IS Personnel were measured to determine if providers of services were ready to deliver good services in terms of availability of the systems to users, IS personnel giving services that address individual attention and providing specific needs for users.

To measure service quality a Likert scale of 1 to 4 was used as follows;
**1 =Yes, 2 =No, 3 = Maybe, 4 = Don't Know**

## a) The e-Government system/service providers always ready to help

The study found that IS providers were ready to help with Microsoft Outlook which was rated at 89% seconded by IFMIS at 55% as shown in Figure 4.11. This implies that IS providers delivered Microsoft outlook and IFMIS well compared to Skype for Business and Share Point rated at 32% at 19% respectively.
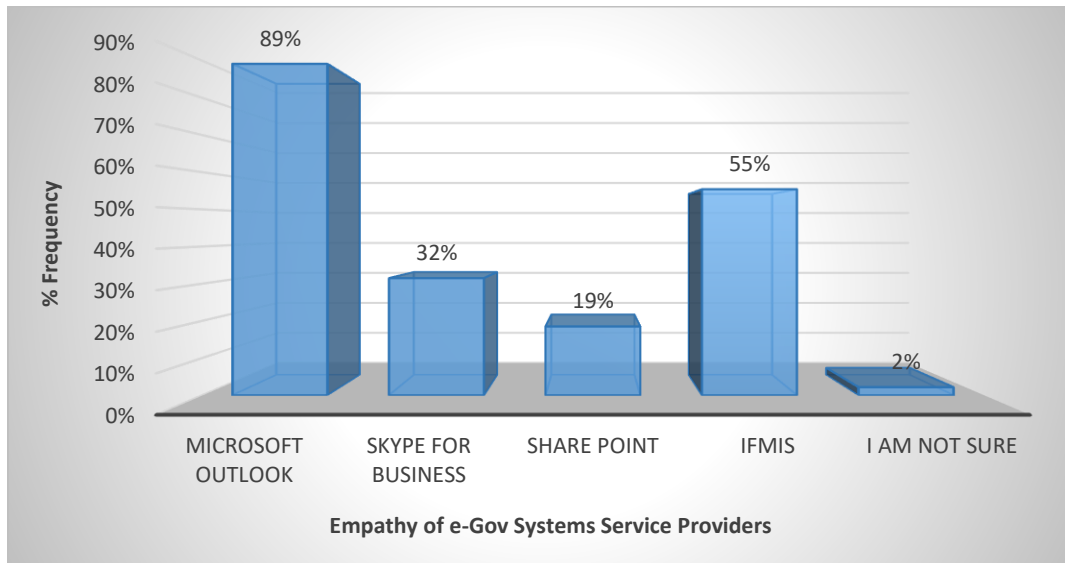


*Figure 4.11:*     *e-Government System Service Providers Always Ready to Help*

## b) Availability of Services

Respondents were asked if the services and systems provided by the e-Government department were always available. Figure 4.12 shows respondents who agreed to the availability of services at 39%, however, 34% disagreed and 26% were not sure.
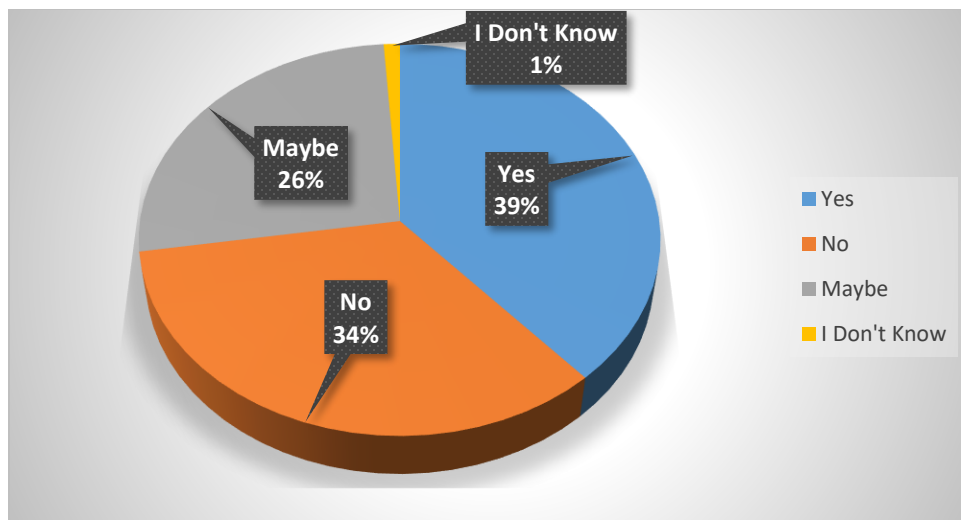
*Figure 4.12:    Availability of Services*

Respondents were asked to give reasons why some services provided by IS do not address their needs. Figure 4.13 shows that most of the respondents at 54% mentioned that they do not know how to use the provided services.
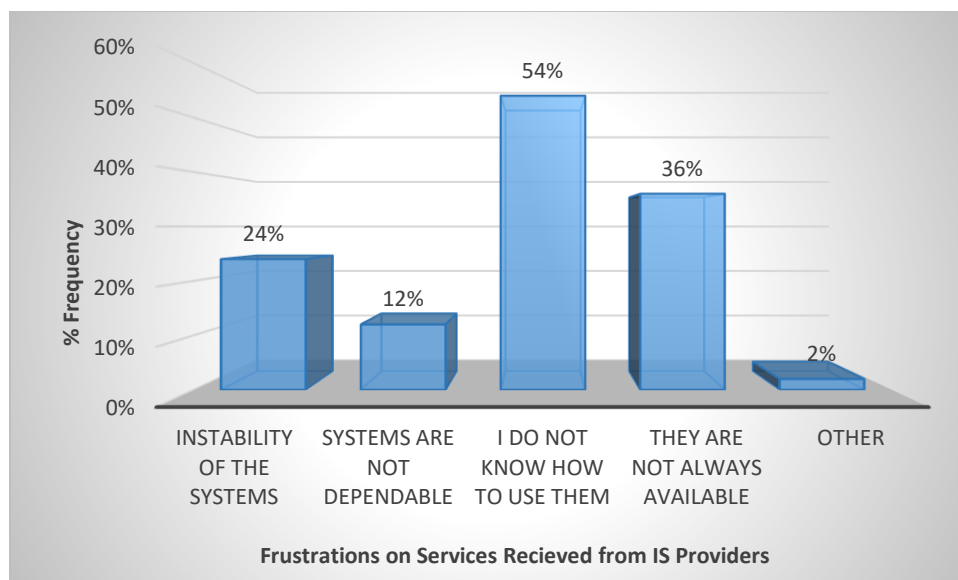


*Figure 4.13:    Reasons for not Understanding User Specific Needs*

## c) Descriptive Analysis of Service Quality

Table 4.21 summarizes the measure on the readiness of personnel in the use of e-Government systems as follows: provision of individual attention; understanding of specific needs; provision

of security and protecting privacy; and making the services available. The study found that 61.1% of the respondents agreed that the services were secure and protect privacy while 57.8% respondents mentioned that IS personnel provide individual attention. Availability of services was rated 41.1% whilst IS providers understanding specific needs was ranked 43.3%.

**Table 4.21:** **Measuring Readiness of Personnel in the use of e-Government Systems (Pivot Table)**

| Measure | Secure and protect privacy | | Give individual attention | | Available at all times | | Understand specific needs | |
|---|---|---|---|---|---|---|---|---|
| | **Number** | **%** | **Number** | **%** | **Number** | **%** | **Number** | **%** |
| **Yes** | 55 | **61.1** | 52 | **57.8** | 37 | **41.1** | 39 | **43.3** |
| **No** | 3 | **3.3** | 13 | **14.4** | 30 | **33.3** | 18 | **20.0** |
| **Maybe** | 26 | **28.9** | 24 | **26.7** | 22 | **24.4** | 28 | **31.1** |
| **I Don't Know** | 6 | **6.7** | 1 | **1.1** | 1 | **1.1** | 4 | **4.4** |
| **Total** | **90** | | **90** | | **90** | | **89** | |

## d) Composite Scoring on Service Quality

A composite scoring was done by computing all the variables in the service quality dimension to get a weighted average of an overall rating. A weighted average was required to account for the fact that the ratings from the respondents of the survey were not equally distributed amongst the variables constituted to measure service quality. The scores were calculated by the mean of the items included in each domain as depicted in Figure 4.14.
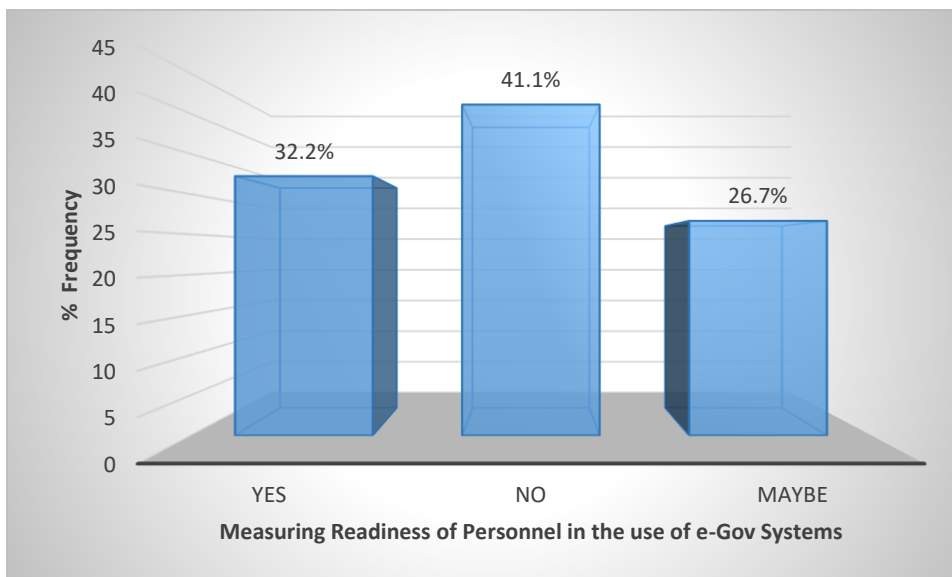


**Figure 4.14:** **Service Quality Rating**

After running a frequency analysis on how e-Government system providers meet the government worker's needs in terms of: individual attention; understanding specific needs; secure and protect privacy and availability; on the overall; only 32.2 % of the respondents were satisfied with e-Government systems service quality. However, the number of those who were not satisfied and answered "No" was high averaging 41.1%. There is a need to find out further as to why government staff are not satisfied with e-Government services provided. The number of respondents who were not sure of the services was equally high at 26.7%.

Table 4.22 is a descriptive statistics representation showing the minimum of the rating at 1 and maximum 3. After running the analysis by aggregating the variables to get a weighted average, it was found that '4' which was 'I don't Know' was dropped from the scale of '1 – 4'. The study used a weighted-averaging technique to give data values closest to the value forecasted or estimated greater importance, or influence, as opposed to values further away.

**Table 4.22:      Service Quality Average Rating**

|  | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Information Quality | 90 | 1 | 3 | 1.94 | 0.770 |

**e)  Reliability Analysis on Composite Variables**

High reliability means that the scale measures the readiness of personnel in the use of e-Government systems, while low reliability means the measure is on something different. Cronbach's alpha tests check whether multiple-question Likert scale surveys are reliable. These questions measure latent variables hidden or unobservable variables such as a person's conscientiousness, obsession or honesty. Cronbach's alpha lets a researcher know if the designed tests are accurately measuring the variable of interest. (Center, no date).

The study needed to ensure that the questionnaire used in the study measured the readiness of personnel in the use of e-Government systems in a useful way. Table 4.23 shows the results of the reliability analysis on the four composite variables: 'Secure and Protect Privacy'; 'Availability'; 'Individual Attention'; and 'Understands Specific Needs' all measuring Service Quality (SV).

As seen from Table 4.23, it was found that the subscale's alpha level was 0.611, which indicates that the subscale had a questionable level of inter-item reliability. This implies that the four composite items may not have been measuring the same thing that is Service Quality (SV). Further analysis found that deleting any of the items would not have significantly increased the alpha level except for the item on "Secure and Protect Privacy" which would push the subscale's alpha level to 0.703 which is acceptable.

**Table 4.23:      Reliability statistics on Service Quality**

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|---|---|---|
| .611 | .632 | 4 |

**Item-Total Statistics**

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|---|
| Are transactions within the e-Government systems? secure and protect privacy? | 5.54 | 4.615 | .191 | .059 | .703 |
| Are the e-Government systems available at all times? | 5.49 | 4.230 | .506 | .301 | .467 |
| Do e-Government systems give you individual attention? | 5.65 | 3.843 | .556 | .382 | .416 |
| Do the e-Government systems understand your specific needs? | 5.39 | 4.196 | .378 | .241 | .550 |

**f)   Service Quality Validity Analysis**

It was found in this test that the "Services" subscale was positively correlated with the "Information Systems Providers" subscale, $r(df = 89) = .231$, $p > .01$. The correlation coefficient of .231 is weak as shown in Table 4.25. The correlation is not significant.

In order to run a validity analysis test on service quality, the variables '*available at all times*' and '*secure and protect privacy*' were combined to create a subscale '*Services*'. Further, the variables

'*give individual attention*' and '*understand specific needs*' were also combined to create a subscale 'Information Systems Providers' as shown in Table 4.24.

**Table 4.24:** **Validity test on Service Quality**

| | | Services | Information Systems Providers |
|---|---|---|---|
| Services | Pearson Correlation | 1 | 0.231[*] |
| | Sig. (2-tailed) | | 0.028 |
| | N | 90 | 90 |
| Information Systems Providers | Pearson Correlation | 0.231[*] | 1 |
| | Sig. (2-tailed) | .028 | |
| | N | 90 | 90 |

*. Correlation is significant at the 0.05 level (2-tailed).

## g) Factor Analysis

### i) *Descriptive Analysis*

The mean values in Table 4.26 conclude that "e-Government systems providers understand specific needs" with a mean value of 1.97 is the most recognized service that influences government workers to utilize the e-Government system. The next service is 'Availability with a mean value of 1.87. 'e-Government systems secure and protect privacy' was third with the mean of 1.82, however, it had the highest standard deviation of 1.072.

**Table 4.25:** **Item Statistics - Service Quality**

| Variables | Mean | Std. Deviation | N |
|---|---|---|---|
| Do the e-Government systems providers understand your specific needs | 1.97 | 0.971 | 89 |
| Are the e-Government systems always available | 1.87 | 0.828 | 89 |
| Are transactions within the e-Government systems secure and protect privacy | 1.82 | 1.072 | 89 |
| Do e-Government systems providers give you individual attention? | 1.71 | 0.907 | 89 |

## ii)    *The Correlation Matrix*

The next output from the Factor Analysis was the correlation coefficient. The correlation coefficient between the variable and itself is always 1 as shown in Table 4.26, hence the principal diagonal of the correlation matrix contains 1s.

All measures were recorded on a 4-point Likert scales anchored by 1 =Yes, 2 =No, 3 = Maybe, 4 = I don't Know. Table 4.26 indicates the very weak presence of relationships. The results are as follows:

i.    The largest value of the coefficient was '*e-Government systems Providers give individual attention*' and '*e-Government systems available at all times*' correlated at.514.

ii.    The second largest is '*e-Government systems Providers give individual attention*' and '*e-Government systems providers understand specific needs*' correlated at .479.

iii.    The third-largest is '*Government systems available at all times*' and '*the e-Government systems providers understand specific needs*' correlated at .334.

However, the p-values for the correlation between the variables for the 3 scenarios are all less than the significance level of 0.01, which indicate that the correlation coefficients are significant.

The lowest correlation in column 2 was at .060, '*e-Government providers understand specific needs*' and '*transactions secure and protect privacy*'. This means that the relationship between the two variables was very weak or does not exist at all. Further, the p-value for the correlation between variables was more than the significance levels of 0.01, this indicates that the correlation coefficients were not significant. There was unsatisfying evidence about the significance of the association amongst these variables.

**Table 4.26:        Correlation Matrix - Service Quality**

| | | Transactions within the e-Government are systems secure and protect privacy | e-Government systems available at all times | e-Government systems Providers give individual attention | e-Government systems providers understand specific needs |
|---|---|---|---|---|---|
| Transactions within the e-Government are systems secure and protect privacy | Pearson Correlation | 1 | .235* | .176 | .060 |
| | Sig. (2-tailed) | | .026 | .098 | .579 |
| | N | 90 | 90 | 90 | 89 |
| e-Government systems available at all times | Pearson Correlation | .235* | 1 | .514** | .334** |
| | Sig. (2-tailed) | .026 | | .000 | .001 |
| | N | 90 | 90 | 90 | 89 |
| e-Government systems Providers give individual attention | Pearson Correlation | .176 | .514** | 1 | .479** |
| | Sig. (2-tailed) | .098 | .000 | | .000 |
| | N | 90 | 90 | 90 | 89 |
| e-Government systems providers understand specific needs | Pearson Correlation | .060 | .334** | .479** | 1 |
| | Sig. (2-tailed) | .579 | .001 | .000 | |
| | N | 89 | 89 | 89 | 89 |
| *. Correlation is significant at the 0.05 level (2-tailed). | | | | | |
| **. Correlation is significant at the 0.01 level (2-tailed). | | | | | |

*iii)* **KMO and Bartlett's Test**

As shown in the KMO and Bartlett's test Table 4.27, the KMO value of 0.655 was obtained. This was significantly based on the 0.5 threshold. From the KMO and Bartlett's Test table, the Bartlett's Test of Sphericity was significant ($<.01$) that is the significance was less than 0.05. This implies that the significance level was small enough to reject a null hypothesis meaning that the correlation matrix was not an identity matrix. The variables were significantly correlated.

**Table 4.27:        KMO and Bartlett's Test – Service Quality**

| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | 0.655 |
|---|---|---|
| Bartlett's Test of Sphericity | Sig. | .000 |

In conclusion, the tests conducted in the service quality dimension accurately measured the variable of interest such as '*secure and protect privacy'*, '*Give individual attention', 'Available at all times' and 'Understand specific needs.*' It was observed that the correlations between variables were weak and, in some instances, the correlation did not exist at all.

PCA test was not conducted for service quality since the variables were few in this dimension.

### 4.2.5  Use/ Intention to Use

This section assessed the behaviours and attitude of users' dependency on the e-Government systems and how often these systems are utilised. The study had eight questions in the survey to measure the behaviour and attitude of users regarding dependency and frequency of use of the e-Government system. To measure 'intention to use/use' a Likert scale of 1 to 4 was used such as;

**1 =Higher, 2 =High, 3 = Medium, 4 = Low.**

**a)  Descriptive Analysis of Intention to Use/Use**

The study used descriptive analysis to assess the frequency of the values observed. Table 4.28 shows the assessment of 'intention to use/use' of the e-Government Systems. IFMIS was highly rated as 'higher' at 63.2% on 'dependability' and 66.7% as 'higher' on 'Desired services'. Most

of the respondents at 55.2% rated Share Point for 'dependability' and 66.7% for 'Desired Services'. This implies that respondents might have no intention to use Share Point.

**Table 4.28:         Assessing the Use/Intention to Use (Pivot Table)**

| Measure | Variable | Microsoft Outlook | | Skype for Business | | Share Point | | IFMIS | |
|---|---|---|---|---|---|---|---|---|---|
| | | Number | % | Number | % | Number | % | Number | % |
| **Dependability** | Higher | 46 | 51.1 | 12 | 13.5 | 6 | 6.9 | 55 | 63.2 |
| | High | 29 | 32.2 | 15 | 16.9 | 9 | 10.3 | 16 | 18.4 |
| | Medium | 11 | 12.2 | 37 | 41.6 | 24 | 27.6 | 8 | 9.2 |
| | Low | 4 | 4.4 | 25 | 28.1 | 48 | 55.2 | 8 | 9.2 |
| **Frequency of Use** | Higher | 48 | 53.3 | 7 | 8.0 | 3 | 3.4 | 60 | 66.7 |
| | High | 24 | 26.7 | 10 | 11.4 | 6 | 6.9 | 17 | 18.9 |
| | Medium | 13 | 14.4 | 32 | 36.4 | 20 | 23.0 | 7 | 7.8 |
| | Low | 5 | 5.6 | 39 | 44.3 | 58 | 66.7 | 6 | 6.7 |

**b) Rarely Used Services**

The respondents were asked to state which service/system they rarely use in their organizations. As shown in Figure 4.15, Share Point was rated the highest at 69%, followed by Skype for business at 44%. Microsoft Outlook and IFMIS rated 36% and 10% respectively for services they do not use, 10% were not sure.
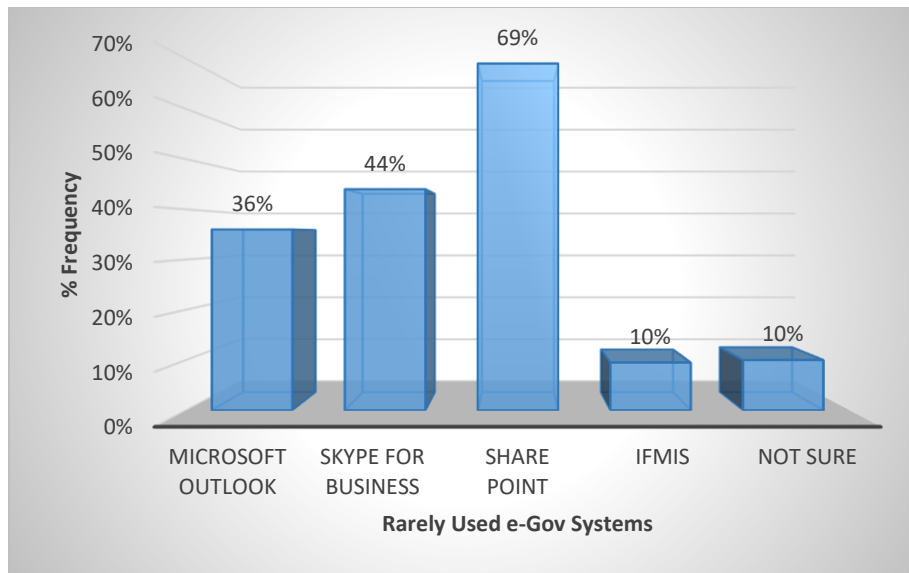
**Figure 4.15:** **Rarely Used e-Government Systems**

## c) Assessing the Use / Intention to Use

A composite scoring was done by combining user 'Frequency of Use' and 'Service Dependability' to get an overall Intention to Use/Use rating. The scores were calculated by the mean of the items included in each domain as depicted in Figure 4.16.

The results show in Figure 4.16 that the government employees' dependency and frequency of use of e-Government systems is rated moderate at 65.6%. However, 28.9% of the respondents further stressed that intention to use of the services is high.
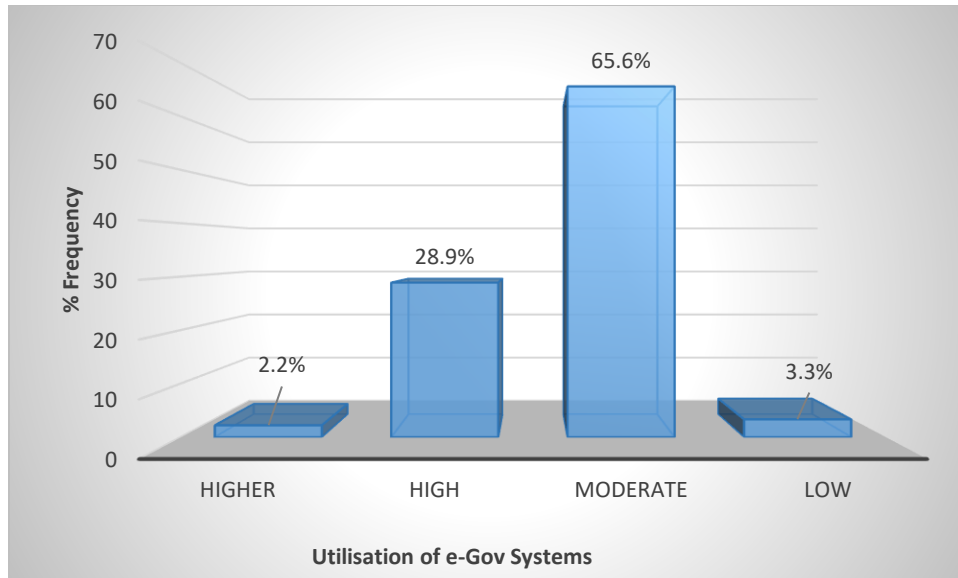
**Figure 4.16:** **Utilisation of e-Government Systems**

An analysis was made by aggregating the variables to get a weighted average of the scores. Table 4.29 is a descriptive statistics representation showing the minimum of the rating at 1 and maximum 4, a mean value of 2.70 and a standard deviation of 1.563.

**Table 4.29:** **Intention to Use Average Rating**

|  | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Information Quality | 90 | 1 | 4 | 2.70 | 0.570 |

## d) Reliability Analysis on Composite Variables

Cronbach's alpha is the widely used tool that measures internal consistency that is reliability. It is mostly used when a study has multiple Likert questions in a questionnaire that form a scale and a researcher wishes to determine if the scale is reliable. The acceptable reliability value is 0.7. Therefore, if the questionnaire's reliability result is less than 0.6 then the questionnaire is considered "questionable".

In order to understand whether the questions in the questionnaire reliably measured the same latent variable, a Cronbach's alpha was run on a sample size of 90 government employee. The Cronbach's alpha value for 8 items is shown in Table 4.30 to be approximately 0.682. Therefore, the questionnaire is considered questionable.

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**Table 4.30:**    **Reliability Statistics – Intention to Use/Use**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|---|---|---|
| 0.682 | 0.684 | 8 |

Table 4.31 "Item Total Statistics" shows the results for Cronbach Alpha 'if Item Deleted'. It is the measure of reliability to determine the "Item" which when deleted would improve the overall reliability of the measuring instrument. Although overall Cronbach's alpha was 0.682, it would increase if one item was deleted "*Dependability on IFMIS*" from the model as shown in Table 4.31 below;

**Table 4.31:**    **Item-Total Statistics – Use/ Intention to Use**

| | Variables | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|---|---|
| 1 | Dependability on Microsoft Outlook | 17.79 | 12.652 | .504 | .608 | .622 |
| 2 | Dependability on Skype for Business | 16.60 | 12.244 | .465 | .700 | .628 |
| 3 | Dependability on Share Point | 16.15 | 12.518 | .480 | .660 | .626 |
| 4 | Dependability of IFMIS | 17.83 | 14.189 | .178 | .678 | .700 |
| 5 | Frequency of use of Microsoft Outlook | 17.74 | 12.485 | .486 | .581 | .624 |
| 6 | Frequency of use of Skype for Business | 16.31 | 13.566 | .302 | .624 | .669 |
| 7 | Frequency of use of Share Point | 15.95 | 13.901 | .339 | .612 | .660 |
| 8 | Frequency of use of IFMIS | 17.96 | 14.059 | .256 | .612 | .678 |

It was seen from Table 4.31 that removal of any question, except question 4, would result in a lower Cronbach's alpha. Removal of question 4 would lead to a small improvement in Cronbach's alpha that is value increased from 0.682 to 0.700 which is acceptable, and it was seen that the "Corrected Item-Total Correlation" value was low (0.178) for this item. Therefore, question 4 was not to be removed because the difference was very minimal.

**e)  Factor Analysis**

Principal Component Analysis (PCA) was used in this section to assess the behaviours and attitude of users' dependency on the e-Government systems and how often these systems are utilised.

## i) Descriptive Statistics

Running descriptive statistics on the dependability and frequency of use of e-Government services just proved what was assumed in the earlier analysis that IFMIS (mean rating = 1.54) and Microsoft Outlook (mean rating = 1.72) are highly ranked in terms of 'Frequency of Use'. Skype for Business (mean rating = 3.17) and Share Point (mean rating = 3.53) came in third and fourth positions in terms of their ratings as shown in Table 4.32.

**Table 4.32:    Descriptive Analysis –Use/ Intention to Use**

|   |   | N | Min | Max | Mean | Std. Deviation |
|---|---|---|---|---|---|---|
| 1 | Frequency of use of Share Point | 87 | 1 | 4 | 3.53 | .775 |
| 2 | Dependability on Share Point | 87 | 1 | 4 | 3.31 | .919 |
| 3 | Frequency of use of Skype for Business | 88 | 1 | 4 | 3.17 | .925 |
| 4 | Dependability on Skype for Business | 89 | 1 | 4 | 2.84 | .987 |
| 5 | Frequency of use of Microsoft Outlook | 90 | 1 | 4 | 1.72 | .912 |
| 6 | Dependability on Microsoft Outlook | 90 | 1 | 4 | 1.70 | .854 |
| 7 | Dependability on IFMIS | 87 | 1 | 4 | 1.64 | .988 |
| 8 | Frequency of use of IFMIS | 89 | 1 | 4 | 1.54 | .905 |
|   | Score | 90 | 0 | 0 | .00 | .000 |
|   | Valid N (listwise) | 84 |   |   |   |   |

From Table 4.32, it can also be seen that Microsoft Outlook (mean rating = 1.7) and IFMIS (mean rating = 1.64) were rated highly in terms of dependability. This is because, among the respondents, the two e-Government services seem to be the widely used. Skype for Business (mean rating = 2.84) and Share Point (mean rating = 3.31) came in third and fourth positions in terms of their ratings.

## ii)    The Correlation Matrix

In this section, a correlation matrix was used to identify patterns of relationships between variables, to input to PCA analysis and also to help in checking the results of the analysis. The correlation matrix in Table 4.33 is showing correlation coefficients between sets of variables. Each random variable ($X_i$) in the table is correlated with each of the other values in the table ($X_j$). This allowed the study to see which pairs have the highest correlation.

**Table 4.33:    Correlation Matrix - Intention to Use/Use**

| | Dependability on Ms Outlook | Dependability on Skype for Business in | Dependability on Share Point | Dependabi lity on IFMIS | Frequency of use of Ms Outlook | Frequency of use of Skype for Business | Frequency of use of Share Point | Frequency of use of IFMIS |
|---|---|---|---|---|---|---|---|---|
| **Dependability on Ms Outlook** | 1 | .334** | .213* | .323** | .685** | 0.097 | 0.075 | 0.169 |
| | | 0.001 | 0.047 | 0.002 | 0 | 0.37 | 0.489 | 0.113 |
| | 90 | 89 | 87 | 87 | 90 | 88 | 87 | 89 |
| **Dependability on Skype for Business** | .334** | 1 | .598** | -0.11 | 0.176 | .593** | .315** | -0.106 |
| | 0.001 | | 0 | 0.314 | 0.098 | 0 | 0.003 | 0.324 |
| | 89 | 89 | 87 | 86 | 89 | 88 | 87 | 88 |
| **Dependability on Share Point** | .213* | .598** | 1 | 0.038 | 0.117 | .276** | .569** | 0.096 |
| | 0.047 | 0 | | 0.733 | 0.279 | 0.01 | 0 | 0.38 |
| | 87 | 87 | 87 | 85 | 87 | 86 | 86 | 86 |
| **Dependability on IFMIS** | .323** | -0.11 | 0.038 | 1 | .355** | -.291** | -.247* | .753** |
| | 0.002 | 0.314 | 0.733 | | 0.001 | 0.007 | 0.023 | 0 |
| | 87 | 86 | 85 | 87 | 87 | 86 | 85 | 86 |
| **Frequency of use of Ms Outlook** | .685** | 0.176 | 0.117 | .355** | 1 | 0.156 | 0.16 | .274** |
| | 0 | 0.098 | 0.279 | 0.001 | | 0.147 | 0.14 | 0.009 |
| | 90 | 89 | 87 | 87 | 90 | 88 | 87 | 89 |
| **Frequency of use of Skype for Business** | 0.097 | .593** | .276** | -.291** | 0.156 | 1 | .527** | -0.082 |
| | 0.37 | 0 | 0.01 | 0.007 | 0.147 | | 0 | 0.448 |
| | 88 | 88 | 86 | 86 | 88 | 88 | 86 | 87 |
| **Frequency of use of Share Point** | 0.075 | .315** | .569** | -.247* | 0.16 | .527** | 1 | -0.027 |
| | 0.489 | 0.003 | 0 | 0.023 | 0.14 | 0 | | 0.806 |
| | 87 | 87 | 86 | 85 | 87 | 86 | 87 | 86 |
| **Frequency of use of IFMIS** | 0.169 | -0.106 | 0.096 | .753** | .274** | -0.082 | -0.027 | 1 |
| | 0.113 | 0.324 | 0.38 | 0 | 0.009 | 0.448 | 0.806 | |
| | 89 | 88 | 86 | 86 | 89 | 87 | 86 | 89 |

**\*\*. Correlation is significant at the 0.01 level (2-tailed).**

**Sig. (2-tailed)**

As can be seen from Table 4.33, significant correlations were flagged and highlighted blue. The larger the absolute value of the coefficient, the stronger the relationship between the variables.

A negative correlation means that as variable 1 increases, variable 2 decreases and vice versa. The variables move in opposite directions when there is a negative correlation as illustrated by the negative correlation between 'F*requency of use of IFMIS*' and 'D*ependability on Skype for Business*'. There is also a relatively high correlation between '*Frequency of use of IFMIS*' and 'D*ependability on IFMIS'*

Two composite variables that fall under the Use/Intention to Use are Service Dependability sub-scale and Frequency of Use sub-scale. Running a correlation analysis, it was found that there was a positive correlation between the two composite variables. However, it was not very strong as expected, $r(df = 89) = .438$, $p< .01$ but significant. This can be seen in Table 4.34.

**Table 4.34:**      **Correlation Analysis – Intention to Use/Use**

| | | ServiceDependability | FrequencyofUse |
|---|---|---|---|
| ServiceDependability | Pearson Correlation | 1 | .438** |
| | Sig. (2-tailed) | | .000 |
| | N | 90 | 90 |
| FrequencyofUse | Pearson Correlation | .438** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 90 | 90 |

**. Correlation is significant at the 0.01 level (2-tailed).

### iii)      *The KMO and Bartlett's Test*

As shown in the KMO and Bartlett's Test in Table 4.35, the KMO value of .500 was obtained. This is significantly based on the 0.5 threshold. From the KMO and Bartlett's Test table, the Bartlett's Test of Sphericity was significant (<.01) that is the significance was less than 0.05. This means that the significance level was small enough to reject the null hypothesis meaning that the correlation matrix was not an identity matrix. The variables were significantly correlated.

**Table 4.35:** **KMO and Bartlett's Test** – *Intention to Use/Use*

| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | 0.500 |
|---|---|---|
| Bartlett's Test of Sphericity | Sig. | .000 |

#### iv) *Dimension Reduction*

Since the goal of running a PCA is to reduce the set of variables down, the study had a criterion for selecting the optimal number of components that were smaller than the total number of items. One criterion was to choose components that had eigenvalues **greater than 1** Table 4.36, it is seen that the first three components had an eigenvalue greater than 1.  Table 4.36 is a Total Variance Explained table which has 8 components in the rows. The Initial Eigenvalues columns have various eigenvalues 3 values greater than 1. The rule is to have eigenvalues greater than one. The 3 components, from this perspective explains the relationships between item1 through item 8. The 3 component solution accounted for 75.57% of variance as indicated under the cumulative percentage.

**Table 4.36:** **Total Variance Explained** – **Intention to Use/Use**

| | Total Variance Explained | | | | | |
|---|---|---|---|---|---|---|
| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 2.692 | 33.646 | 33.646 | 2.692 | 33.646 | 33.646 |
| 2 | 2.269 | 28.360 | 62.006 | 2.269 | 28.360 | 62.006 |
| 3 | 1.085 | 13.563 | 75.569 | 1.085 | 13.563 | 75.569 |
| 4 | .740 | 9.255 | 84.824 | | | |
| 5 | .668 | 8.345 | 93.169 | | | |
| 6 | .234 | 2.926 | 96.095 | | | |
| 7 | .185 | 2.317 | 98.411 | | | |
| 8 | .127 | 1.589 | 100.000 | | | |
| *Extraction Method: Principal Component Analysis.* | | | | | | |

#### v) *The Rotated Component Matrix*

The idea of rotation is to reduce the number of factors on which the variables under investigation have high loadings. Rotation does not really change anything but makes the interpretation of the

analysis simpler. The rotated component matrix helps to determine what the components represent. Table 4.37 describes rotated component matrix;

**Table 4.37:       The Rotated Component Matrix – Use/ Intention to Use**

| | | Component | | |
|---|---|---|---|---|
| | | **1** | **2** | **3** |
| 1 | Dependability on Microsoft Outlook | 0.142 | 0.108 | 0.904 |
| 2 | Dependability on Skype for Business | 0.759 | -0.136 | 0.283 |
| 3 | Dependability on Share Point | 0.831 | 0.233 | 0.004 |
| 4 | Dependability on IFMIS | -0.174 | 0.877 | 0.267 |
| 5 | Frequency of use of Microsoft Outlook | 0.089 | 0.198 | 0.875 |
| 6 | Frequency of use of Skype for Business | 0.692 | -0.317 | 0.177 |
| 7 | Frequency of use of Share Point | 0.795 | -0.070 | -0.025 |
| 8 | Frequency of use of IFMIS | 0.016 | 0.915 | 0.087 |
| | Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. | | | |
| | a. Rotation converged in 5 iterations. | | | |

Table 4.37 shows that the first component is most highly correlated with variables [2], [3], [6] and [7] is a better representative. The second component is most highly correlated with [4] and [8]. The third component was most highly correlated with [1] and [5]. This suggests that the study can focus on the following for further analysis;

   i.     Dependability on Share Point

   ii.    Frequency of use of IFMIS

  iii.   Dependability on Microsoft Outlook

**f)   Summary of Use/Intention to Use**

Using the 3 extracted variables from the PCA analysis, a composite scoring was run to get a weighted average result of the intention to use/use dimension. Figure 4.17 shows the utilisation of e-Government systems rating based on the factor analysis.  However, the results from the PCA are quite different from the weighted average results shown in Figure 4.16. The results show that intention to use of e-Government systems was high with 3 components in contrast with 8 components that showed moderate.

According to Kumar (2011) reliability refers to a degree to which an instrument produces the same results over several trials**.** Validity refers to the extent that the instrument measures what it was

designed to measure. The tests obtained in this section implies there was little reliability with the instruments used in this dimension.
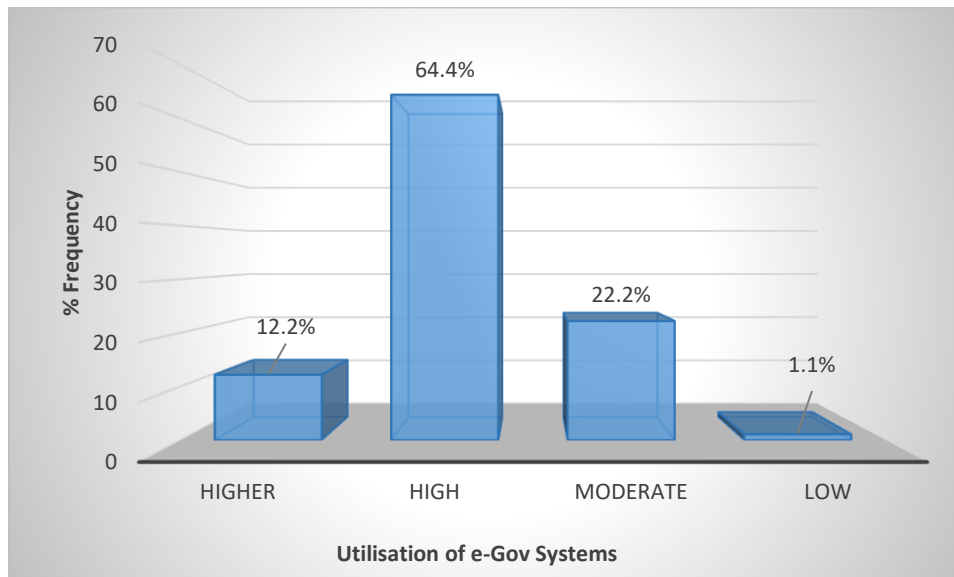


***Figure 4.17:*** ***Utilisation of e-Government Systems based on a Factor Analysis***

### 4.3.6   Change Management

Change management data was analyzed using descriptive statistics which summarized data frequencies. The variables used to assess change management were; 'awareness', 'training', 'makes job easier' and 'usefulness'. To measure 'Change Management' a Likert scale of 1 to 4 was used such as;

**1 =Yes, 2 =No, 3 = Maybe, 4 = Don't Know**


**a)   Awareness of the shared services and systems provided by SZI**

The results in Figure 4.18 show that most of the respondents agreed at 77% that they were aware of the shared services and systems provided by SZI.  Those that were not aware stood at 2%. However, the respondents who were not sure what the e-Government systems represented were 19%.
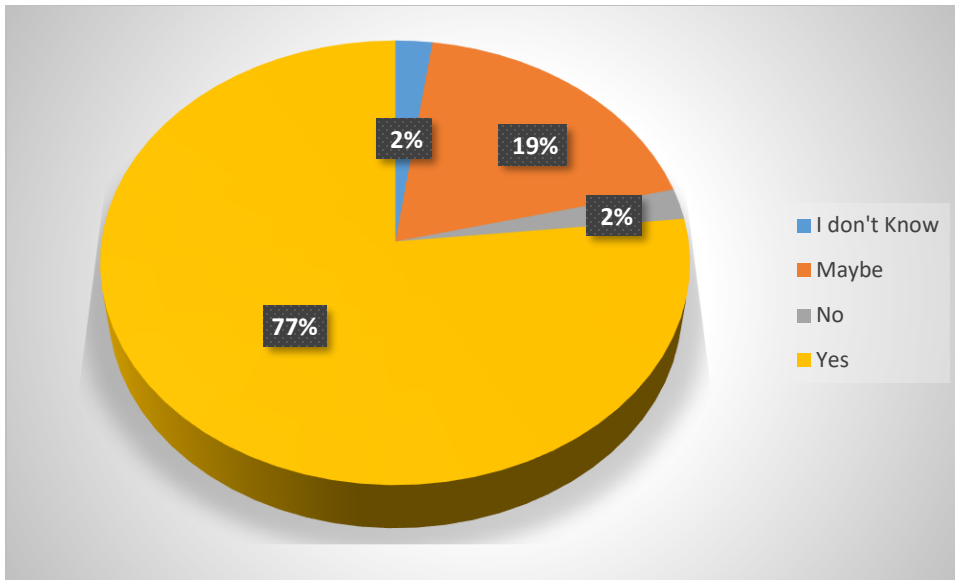
**Figure 4.18:** Awareness of e-Government Systems

## b) Training in systems and shared services

In terms of receiving formal training in any of the services being offered by SZI, the results in Figure 4.19 show that the majority of respondents indicated that they had received formal training at 74% with 26% not having received any formal training in any of the shared services and systems.
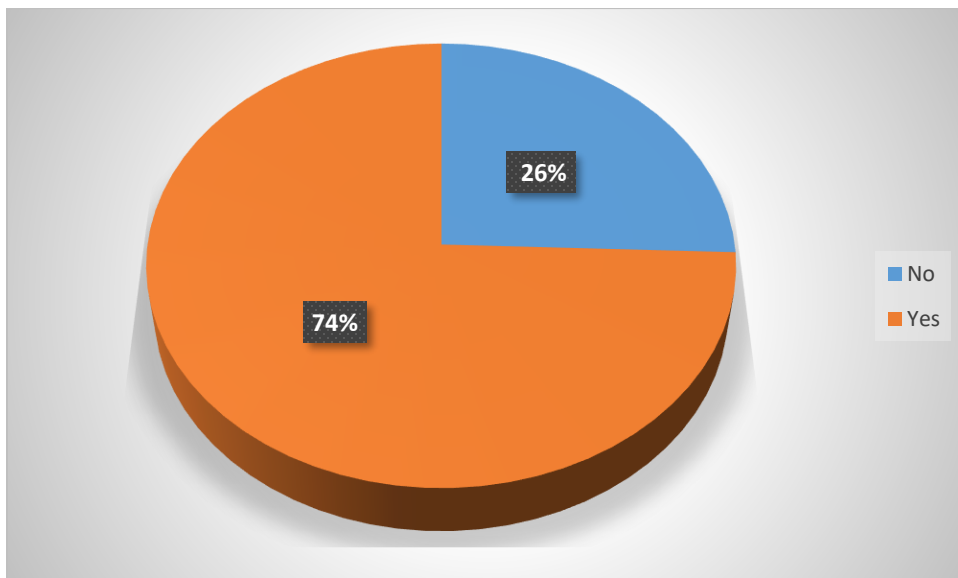


**Figure 4.19:** Training in Systems and Shared Services

### c) Composite Scoring on Change Management

A descriptive statistical method was used to measure government employees' general satisfaction on e-Government's applications. To proceed with reliability analysis, composite scores for each of the change management dimension grouping were calculated. The results for reliability analysis are shown in Figure 4.20.

Results shown in Figure 4.20 indicate that 64.4% of the respondents were aware of e-Government systems, they also agreed that they had the ability to use the systems and that they received their training. However, 28% were not aware of e-Government systems and were not trained, 19% were not sure. This indicates that government employees had some degree of awareness, had the ability to use systems and received formal training on the utilization of specific systems and services.
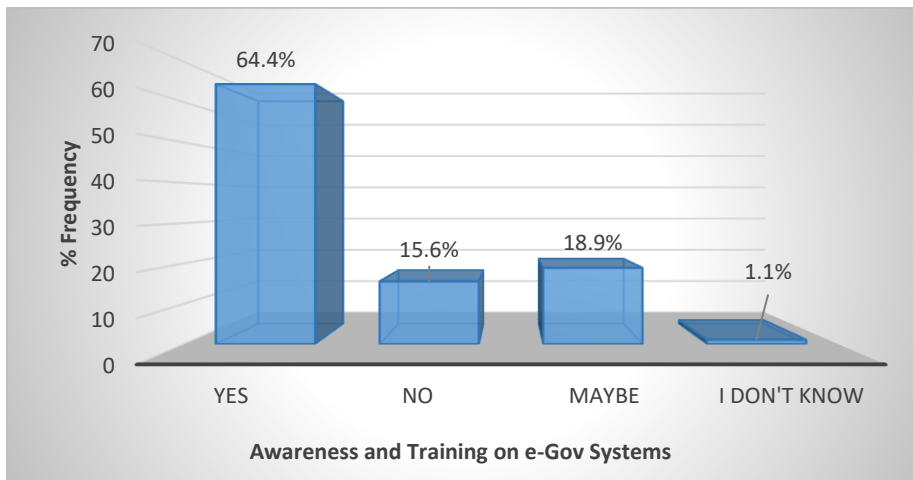


**Figure 4.20:**         **Awareness and Training on e-Government systems**

Table 4.38 is a descriptive statistics representation showing the minimum of the rating at 1 and maximum 4. The study used a weighted-averaging technique to give data values closest to the value being forecast or estimated greater importance, or influence, as opposed to values further away.

**Table 4.38:**         **Change Management Average Rating**

|  | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Information Quality | 90 | 1 | 4 | 1.57 | 0.835 |

## d) Change Management Reliability Analysis on Composite Variables

The study needed to ensure that the questionnaire used in the study evaluates the government employees' general satisfaction with the e-Government applications in a useful way. Table 4.39 shows the results of the reliability analysis on the 4 composite variables 'awareness', 'training', 'usefulness of the services' and 'make job easier' all measuring Change Management (CM).

**Table 4.39:       Reliability Statistics – Change Management**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|---|---|---|
| 0.756 | 0.677 | 4 |

As seen from Table 4.39, it was found that the subscale's alpha level was .756, this was acceptable, it indicates that the subscale had an adequate level of inter-item reliability. This means that the 4 composite items were measuring the same thing that is Change Management (CM).

## e) Change Management Validity Analysis

Validity analysis test found that the "*awareness and training*" subscale was positively correlated with the "*ability*" subscale, $r(df = 89) = 0.626$, $p < .01$. The correlation coefficient of 0.626 is significant as shown in Table 4.40.

**Table 4.40:       Validity test on Change Management**

|  |  | Awareness and Training | Ability |
|---|---|---|---|
| Awareness and Training | Pearson Correlation | 1 | 0.626** |
|  | Sig. (2-tailed) |  | .000 |
|  | N | 90 | 90 |
| Ability | Pearson Correlation | 0.626** | 1 |
|  | Sig. (2-tailed) | .000 |  |
|  | N | 90 | 90 |

**. Correlation is significant at the 0.01 level (2-tailed).

## f) Change Management Factor Analysis

*Descriptive Statistics*

The mean values in the descriptive statistics in Table 4.41 conclude that item 1 'e-Government systems make job easier' has the highest mean value of 1.90, and the highest standard deviation of 1.027. Items 4 was the second-highest with a mean of 1.79 and second highest standard

deviation of 0.966. This indicates that most respondents rated that e-Government systems make their job easier, however, a high standard deviation meant that the values were spread out over a wider range. This was because of different responses from respondents with regard to the systems in question.

**Table 4.41:** **Descriptive Statistics - Change Management**

|   |   | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---------|---------|------|----------------|
| 1 | e-Government systems make job easier | 63 | 1 | 4 | 1.90 | 1.027 |
| 2 | Awareness on e-Government systems provided by SZI | 90 | 1 | 4 | 1.47 | 0.877 |
| 3 | Received formal training on e-Government systems | 90 | 1 | 2 | 1.26 | 0.439 |
| 4 | Usefulness of e-Government systems to the job | 90 | 1 | 4 | 1.79 | 0.966 |
|   | Valid N (listwise) | 63 |   |   |   |   |

### i) The Correlation Matrix

A positive correlation means that high scores on one side are associated with high scores on the other and that low scores on one side are associated with low scores on the other. A statistically significant correlation is indicated by a probability value of less than 0.01.

As can be seen from Table 4.42, significant correlations are flagged. The larger the absolute value of the coefficient, the stronger the relationship between the variables.

A negative correlation means that as variable 1 increases, variable 2 decreases and vice versa. The variables move in opposite directions when there is a negative correlation as illustrated by the negative correlation between '*e-Government systems make job easier*' and 'R*eceived formal training in e-Government systems*'. There is also a relatively high correlation between '*Are you aware of the shared services and systems provided by SZI?*' and '*e-Government systems make your easier*'.

**Table 4.42:**        **Inter-Item Correlation Matrix – Change Management**

| | | e-Government systems make job easier | Awareness on shared services and systems provided by SZI | Received formal training in e-Gov systems | Usefulness of e-Gov systems to the job |
|---|---|---|---|---|---|
| e-Government systems make job easier | Pearson Correlation | 1 | .707** | -.048 | .700** |
| | Sig. (2-tailed) | | .000 | .706 | .000 |
| | N | 63 | 63 | 63 | 63 |
| Awareness on shared services and systems provided by SZI | Pearson Correlation | .707** | 1 | .125 | .662** |
| | Sig. (2-tailed) | .000 | | .242 | .000 |
| | N | 63 | 90 | 90 | 90 |
| Received formal training in e-Gov systems | Pearson Correlation | -.048 | .125 | 1 | -.004 |
| | Sig. (2-tailed) | .706 | .242 | | .971 |
| | N | 63 | 90 | 90 | 90 |
| Usefulness of e-Government systems to the job | Pearson Correlation | .700** | .662** | -.004 | 1 |
| | Sig. (2-tailed) | .000 | .000 | .971 | |
| | N | 63 | 90 | 90 | 90 |
| **. Correlation is significant at the 0.01 level (2-tailed). | | | | | |

## ii)        *The KMO and Bartlett's Test*

As shown in the KMO and Bartlett's Test Table 4.43, the KMO value of 0.713 was obtained. This is significantly based on the 0.5 thresholds. From the KMO and Bartlett's Test table, it can be seen that the Bartlett's Test of Sphericity was significant (<.01) i.e. the significance was less than 0.05. This means that the significance level was small enough to reject the null hypothesis meaning that the correlation matrix is not an identity matrix. The variables were significantly correlated.

**Table 4.43:**        **KMO and Bartlett's Test – Change Management**

| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | 0.713 |
|---|---|---|
| Bartlett's Test of Sphericity | | |
| | | |
| | Sig. | .000 |

### 4.2.7    User Satisfaction

User Satisfaction dimension measured government employees' satisfaction with the e-Government systems, quality, and fulfilled expectations.

**a)    Satisfaction with the e-Government system**

Government employees were asked to pick the services which they were satisfied with, such as IFMIS, Microsoft Outlook, Share Point and Skype for Business. They could pick multiple services. A frequency distribution was run to see which e-Government services had a higher selection; the results are shown on Figure 4.21;
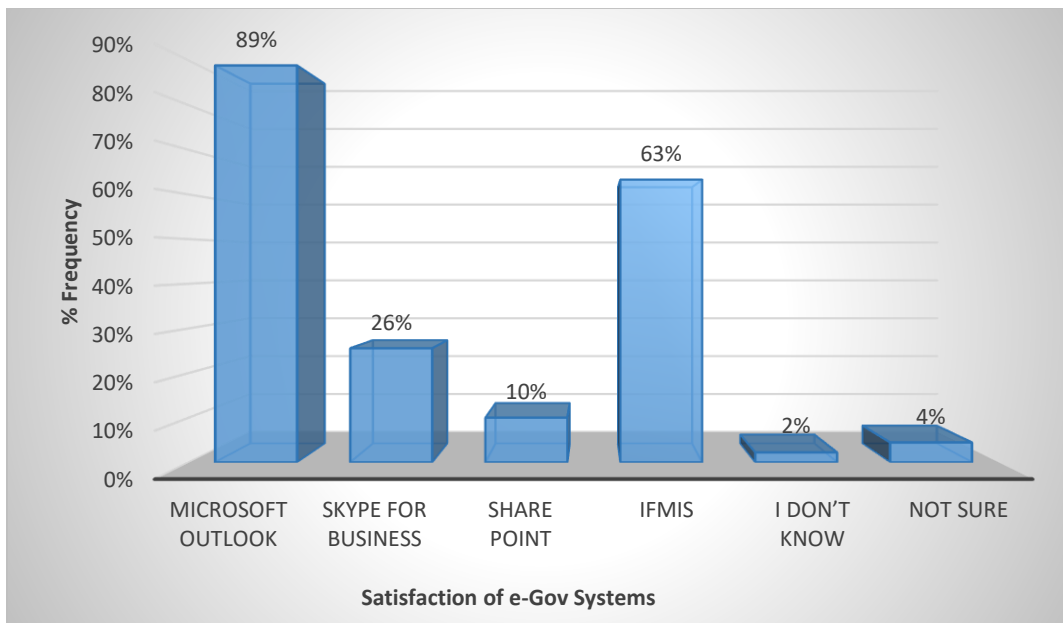


**Figure 4.21:**           **Satisfaction with e-Government Systems**

The results in Figure 4.20 show that 'Microsoft Outlook' was rated the highest at 89%, seconded by 'IFMIS' at 63%. Skype for Business was rated at 26% whilst Share Point was at 10%, 4% of the respondents were not sure whilst 2% mentioned 'I don't Know'.

**b)    Description of Services of the e-Government System**

Government employees were asked to pick the services which they thought were of high quality, that is IFMIS, Microsoft Outlook, Share Point and Skype for Business. They were

allowed to pick multiple services. A frequency distribution was run to see which e-Government services had a higher selection; the results are shown on Figure 4.22;
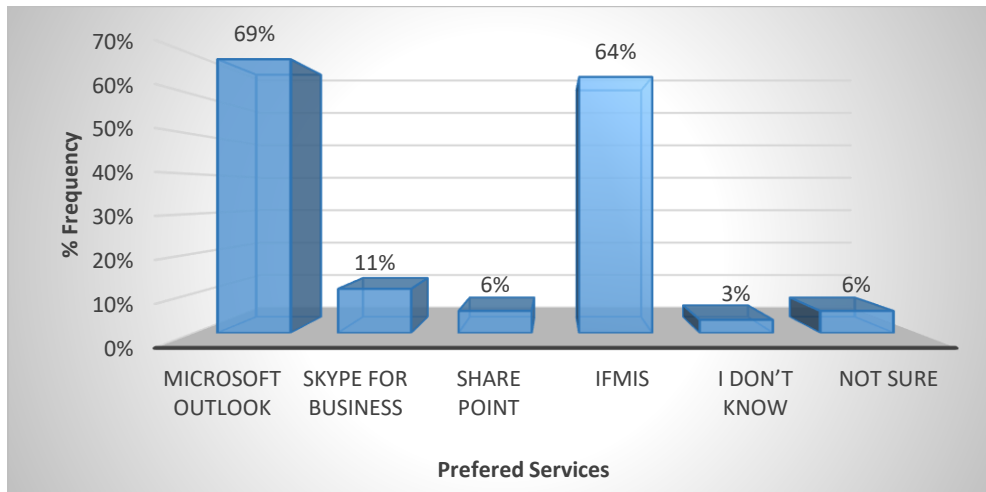


**Figure 4.22:   High Quality Services**

The results in Figure 4.22 show that 'Microsoft Outlook' was rated the highest at 69%, followed by 'IFMIS' at 64%. Skype for Business was rated at 11% whilst Share Point was at 6%. Respondents who were not sure were at 6% whilst 3% mentioned 'I don't Know' of all who responded.

**c)   e-Government Systems that Meet User Expectations**

Government employees were asked if the e-Government systems met their expectations. They could pick multiple services. A frequency distribution was run to see which e-Government services had a higher selection, the results are shown in Figure 4.23.

The results in Figure 4.23 show that 57% of the respondents agree that e-Government systems met their expectations whilst 29% mentioned 'Maybe', 11% disagreed whilst 3% said 'I Don't Know'.
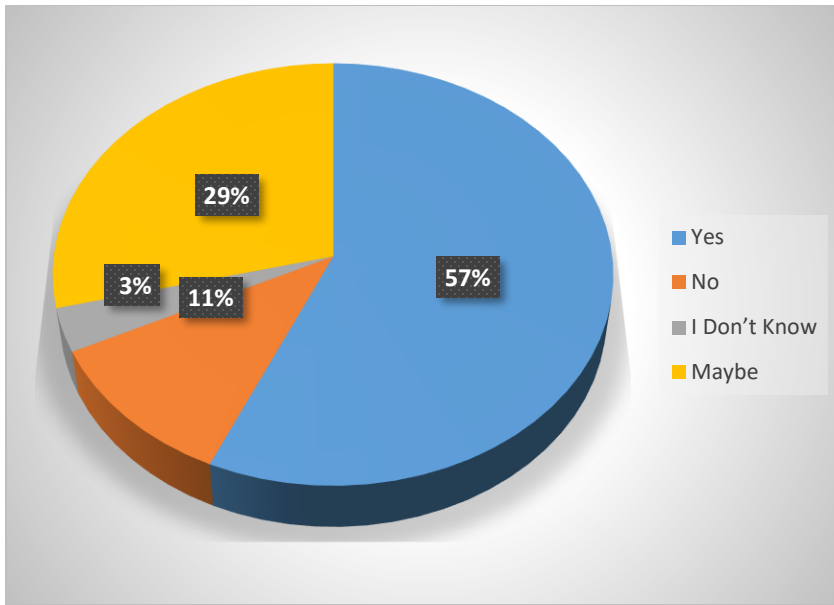
**Figure 4.23:   User Expectations Met**


## d)  Measure of User Satisfaction

A composite scoring was done by combining all the variables in the user satisfaction dimension to get an overall systems quality rating. The scores were calculated by the mean of the items included in each domain as depicted in Figure 4.24.



**Figure 4.24:       User Satisfaction**

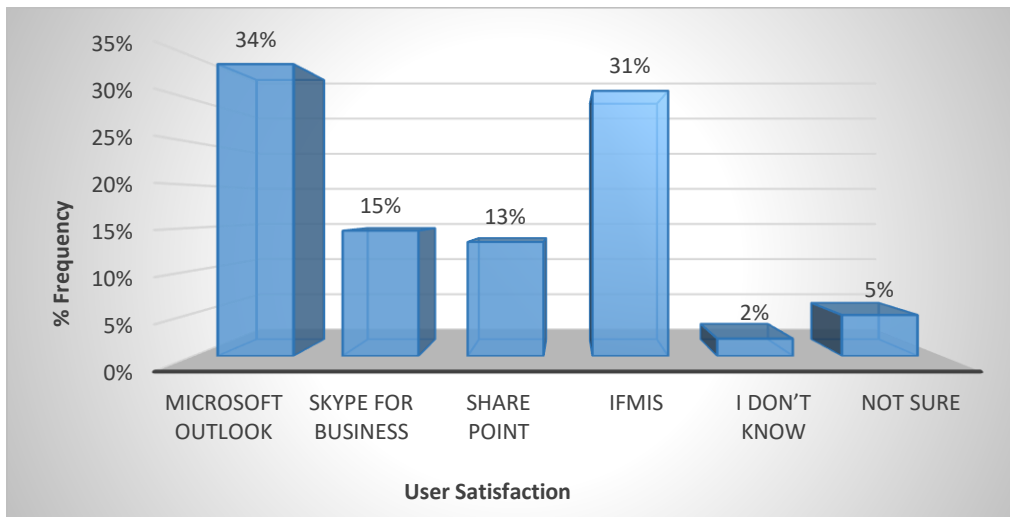The results in Figure 4.24 show the general satisfaction of government employees with e-Government applications rated as follows: 'Microsoft Outlook; was the highest at 34%; followed by with 'IFMIS' at 31%. Skype for Business was rated at 15% whilst Share Point was at 13%, 5% of the respondents were not sure whilst 2% mentioned 'I don't Know'.

### 4.3.8   Summary on Questionnaire Data Analysis

Table 4.44 summarises the survey questionnaire data analysis. The findings of this study confirmed that System Quality with the highest mean of 3.53 was the most valued dimension seconded by Use/Intention to Use with a mean of 2.70, third was Information Quality with a mean of 2.31. Service Quality took the fourth position with a mean of 1.94 whilst change management was last with a mean of 1.57. Information Quality indicated the highest standard deviation, this could mean that the dimension had more variability in the observed data. This is because Information Quality was based mostly on IFMIS and few respondents in the study used IFMIS. The lowest standard deviation was on Use/Intention to Use, this shows that the data were clustered closely around the mean, an indication that the data was more reliable.

**Table 4.44:       Summary on Questionnaire Data Analysis**

|  | System Quality | Information Quality | Service Quality | Use/ Intention to Use | Change Management |
|---|---|---|---|---|---|
| Cronbach's alpha test | 0.822 | 0.985 | 0.703 | 0.682 | 0.677 |
| Validity Test | 0.699 | 0.959 | 0.231 | 0.438 | 0.626 |
| Average Mean & Std Deviation | Mean 3.53 Std Dev .737 | Mean 2.31 Std Dev 1.563 | Mean 1.94 Std Dev .770 | Mean 2.70 Std Dev .570 | Mean 1.57 Std Dev .835 |
| Correlation | Moderate Significant @.000 | Excellent Significant @.000 | Unacceptable Insignificant @.028 | Poor Significant @.000 | Moderate Significant @.000 |
| The KMO and Bartlett's test | .541 Significant @.000 | 0.855 Significant @.000 | .655 Significant @.000 | .500 Significant @.000 | .713 Significant @.000 |
| Principal Component Analysis | Component 1: 0.868 Component 2: 0.937 Component 3: 0.875 Supported | | | Component 1: 0.795 Component 2: 0.915 Component 3: 0.904 Not Supported | |

Cronbach's alpha was used to measure internal consistency. It tested whether multiple question Likert scale surveys were reliable. The study found that the Information Quality dimension had excellent and most reliable variables of interest seconded by System Quality which had good internal consistency. Service Quality came third whose trustworthiness of its variables was

acceptable. Reliability of the variables for Intention to Use/Use and Change Management were moderate. The variables for all the dimensions correlated well except for Service Quality whose variables were unacceptable. Validity refers to the degree that the instrument measures that which it was designed to measure. As can be seen from Table 4.44, Service Quality had a lowest of validity test at 0.231, this result is below a threshold of 0.5. In addition, the variables for Service Quality dimension did not correlate.

The study did not subject, information quality, service quality and change management dimensions to principal component analysis tests because they had few variables. The principal component analysis aims at reducing the number of variables in order to explain and interpret results from the survey.

## 4.4 Discussion of Results

The study assessed the utilization of e-Government Systems by government employees in Zambia. The study justified the model for measuring the success of e-Government systems based on the e-Government Assessment Model.

### 4.4.1 System Quality

DeLone and McLean (2003) define System Quality as acquiring systems that generate the required information for the production of users' needs and demonstrates the performance of the system. It is a desired characteristic of the information system itself. In this study, 'user-friendliness', and 'desired services' were measured in terms of system quality.

The study found that the variables used in system quality questionnaire were valid and agreeable with Stefanovic et. al. (2016) who used the same variables for their study, however, this study dropped the variable 'ease of use' because the variable is synonymous to 'user-friendliness'. Cronbach's alpha tests were used to check whether multiple-question Likert scale surveys were reliable and the study observed that the designed tests were accurately measuring the variable of interest.

The study further found that the correlation coefficient amongst the variables in system quality dimension was questionable, of which other literature would regard as moderate. For the Pearson correlation used in this study, a value close to 1 indicated a perfect linear relationship, however,

there were lots of correlations close to 0. This meant that there was a little linear relationship between these variables. The variables that correlated close to 0 were as follow:

i. user-friendliness of Microsoft Office and user-friendliness of Skype for Business correlated at 0.223; this was because respondents rated MS Outlook to be more user friendly than Skype for business;

ii. user-friendliness of Share Point and user-friendliness MS Outlook correlated at 0.086; this was because respondents rated Share Point to be less user friendly than Microsoft Office;

iii. user-friendliness of IFMIS and user-friendliness of MS Outlook correlated at 0.021; amongst the respondents, few of them use IFMIS;

iv. user-friendliness of IFMIS and user-friendliness of Skype for Business correlated at 0.027; this was because respondents rated IFMIS to be more user friendly than Skype for business;

v. Share Point provide desired services and user-friendliness of MS Outlook correlated at 0.083; more respondents rated MS Outlook to be user friendly and few respondents mentioned that Share Point provided desired services;

vi. IFMIS provide desire services and user-friendliness of MS Outlook correlated at 0.052; fewer respondents rated IFMIS to provide desired services and more respondents mentioned that MS Outlook was user friendly;

vii. IFMIS provide desire services and user-friendliness of skype for business correlated at 0.071; more respondents rated IFMIS to provide desired services and few respondents mentioned that Skype for Business was user friendly.

On the overall, the results showed that the p-value for the correlation level was significant. This study is agreeable with Almutairi and Subramanian (2005) who conducted a study to present an empirical application of the DeLone and McLean (2003) model. They found that certain direct associations between the variables in the original DeLone and McLean (2003) model were supported from the initial correlation analysis. Therefore, system quality impact user satisfaction significantly. System quality has a significant influence on use/intention to use.

The objective of the study was to assess the utilization of the e-Government systems used in government departments. The findings of this study confirmed that System Quality with the highest mean was the most valued among the quality dimensions, system quality standard deviation came second lowest among all the dimensions which meant that its data was reliable.

Idoughi and Abdelhakim (2018) state that higher degrees of system quality is positively associated to higher levels of expressed satisfaction. Literature also confirms that there is a strong positive effect between system quality and user satisfaction. In this study, it was proved that IFMIS and Government e-Mail system that is MS Outlook was found to be significantly related to user satisfaction. The results prove that when government employees find a system user friendly, they will have a desire to use them and the outcome will be user satisfaction which has many benefits attached to it.

The performance of the e-Government systems would even increase further if end users utilize Skype for Business and Share Point. From the study, it is seen that the utilization levels of skype for business and Share Point were low. This could be due to non-sensitization on these two systems. One of the objectives of the e-Government Strategic and Implementation Plan (2013) is to ensure sensitisation on the implementation of the e-services and building capacity in regard to ICT utilisation. Under 7NDP (2017), the focus is to increase investments in ICT infrastructure and human resource development, the Government of Zambia is putting huge investments in the procurement of e-Government systems to make the e-Government programme in Zambia reach its goals, there is need for the government to ensure that systems are adopted and utilized.

### 4.4.2   Information Quality

The vision of the Smart Zambia Master Plan (2018) is to achieve transformation of government into an information and knowledge-based society and economy supported by consistent development of, and pervasive access to ICTs by all citizens by 2030.  DeLone and McLean (2003) state that users perceive the quality of e-Government systems as the quality of contents delivered by these e-services. The success dimension information quality constitutes the desirable characteristics of an IS's output (Idoughi and Abdelhakim, 2018). For this study, the information a government employee generates using a government's IS IFMIS, the study incorporated measures focusing on the quality of the information that IFMIS produced and its usefulness for the user.

The investigation uncovered the significance of information quality on user satisfaction of IFMIS, measured in terms of precise, sufficient, reliable, accuracy, and accurate information. These elements stimulate the view of government employees and create a criterion for assessing system

efficiency (ICT Policy, 2006). The study also investigated how MS Outlook, IFMIS, Skype for Business and Share Point fit organization needs and it was found that IFMIS and MS Outlook are services that were tailor-made for government employees. The association between information quality and user satisfaction is firmly supported in the literature. Studies have found a coherent association between information quality and user satisfaction. Nwone (2014), specifically observed the significance of information quality on user satisfaction of the PG school web portal. Wu and Wang (2006) found information quality to have a greater influence on user satisfaction. They state that the user's perception depends on the quality of the contents and outputs of the IS rather than the system performance and its functions. Researchers such as Ojo (2016), Wang and Liao (2008), and Sterrenberg (2017) did not find a significant relationship between measures of information quality and user satisfaction. Stefanovic *et al.* (2016), specifically examined the information quality aspects of e-Government systems and found that information quality does not directly affect user satisfaction. However, searching for information is the most widely recognized reason for using e-Government services.

It was observed in the study that information quality dimension indicated the highest standard deviation which could mean that there was more variability in the observed data. This is because the investigations on Information Quality was mostly based on IFMIS and few respondents in the study used IFMIS. In terms of internal consistency, the study found that the Information Quality dimension had excellent and most reliable variables of interest. The study further found that the associations between the variables were highly supported by the initial correlation analysis. Therefore, information quality impact user satisfaction significantly and has a significant influence on the intention to use/use. The study has also found that the value of information that IFMIS provides is accurate, sufficient and reliable.

This study observed that the utilization of Skype for Business and Share Point was below average. The study is agreeable with the 7NDP (2017) which state that there are challenges regarding the utilisation of ICT in Zambia. The purpose of Share Point is to allow users to share and manage content, knowledge, and applications to empower teamwork, to find information with ease, and seamlessly collaborate across the organization. SharePoint is a platform used to get connected by engaging in conversations to stay informed and make better decisions. However, the application underutilised and is not serving its intended purpose. This could be because the government

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perhaps did not engage the stakeholders before the implementation in line with the (e-Government Strategic and implementation Plan, 2013).

### 4.4.3 Service Quality

On average, e-Government systems users are not satisfied with the services provided to them. Idoughi and Abdelhakim (2018), defines service quality as 'the consequential outcome of a comparative analysis between the anticipated service and its real performance judged by the end-users'.

When the study applied a frequency distribution technique to give a view of the data which would allow the study to find patterns, it was observed that the respondents were satisfied with the service quality that IS providers offer. However, further analysis showed that e-Government systems users were not satisfied with the services provided to them. This could be because of the two sample applications used in this study namely; Skype for Business and Share Point which were underutilised. If end users have a more prominent desire from an installed system compared to what is delivered, the system would be seen as not to have met the expectations. The study found that Skype for Business and Share Point are the two systems which have not been delivered to user's expectations. Literature reviewed that e-Government success depends highly on service quality and how user-focused they could be.

In terms of internal consistency, the study found that service quality's trustworthiness of its variables was acceptable, however, the associations between the variables were not supported from the initial correlation analysis. The correlation coefficient amongst the variables in service quality dimension was unacceptable. This is because there was no relationship between the data sets. The results showed that the p-value for the correlation level was insignificant. This study is agreeable with Stefanovic et. al. (2016) who conducted a study and found that service quality does not have an effect on user satisfaction. However, Nwone (2014) and Idoughi and Abdelhakim (2018) found service quality to be a significant attribute in measuring user satisfaction.

The research observed that if there are merely close-ended questions in a study, the respondents generally get disengaged and fill it out devoid of really thinking about it. The study included open-ended questions to make users respond the way they liked and allow the respondents to explain their feedback and describe the troubles they faced with the e-Government systems. The study

further analysed the qualitative data from the questionnaire and interviews and found that the IS providers have deployed a number of applications but provided moderate help to ensure that the services are utilised. On the other hand, certain installed applications are not utilised because some users do not know how to use them.

Service quality is measured in terms of performance of service staff on how they respond to complaints and issues arising from e-Government system inadequacies. The receptiveness of ICT support staff in the government goes a long way in tackling problems encountered by e-Government system users. (Organisation for Economic Co-operation and Development, 2007). In addition, the technical ability of the ICT support staff is equally important in addressing complications associated with system attributes. Users require quick responses whenever an incident occurs (United Nations, 2018). Frequent surveys of users' satisfaction are of importance in e-Government, as customer's expectations and behaviours are progressing swiftly in a varying service environment. Findings from the surveys could be used to identify improvements that meet user needs by making services more available and effective. Findings could also be used to revise service quality standards (Organisation for Economic Co-operation and Development, 2007).

### 4.4.4 Use/Intention to Use

The investigation uncovered the significance of 'intention to use' on user satisfaction of the e-Government systems, measured in terms of frequency of use and dependency on the system. The measurement intention to use signified the way in which e-Government systems are utilized by government employees. Urbach and Mueller (2012) state that measuring the usage of information systems could be a broad concept that can be considered from a number of perceptions. Earlier studies measured 'intention to use' impartially by capturing the connect time to systems, the functions utilized, or usage frequency. However, the amount of time a system is used may not be a sufficient good measure as other studies measured by questioning users about their perceived use of a system.

The study found that the variables used in intention to use/use questionnaire were valid and is agreeable with Stefanovic et. al. (2016) who used the same variables for their study. Cronbach's alpha tests were used to check whether multiple-question Likert scale surveys were reliable and the study observed that the designed tests were accurately measuring the variable of interest.

The study further found that the correlation coefficient amongst the variables in intention to use/use dimension was poor, of which other literature would regard it as moderate. For the Pearson correlation used in this study, a value close to 1 indicated a perfect linear relationship, however, there were lots of correlations close to 0 which indicated that there was a little linear relationship between the variables. On the overall, the results showed that the p-value for the correlation level was significant. Therefore, intention to use/use had an impact on user satisfaction significantly.

The findings of this study confirmed that intention to use/use with the second highest mean was a valued dimension, intention to use/use standard deviation was the lowest among all the dimensions which meant that its data was the most reliable.

This study found that government employees' intentions to use of e-Government systems increases if employees notice the e-Government systems to possess some degree of quality in systems provided. The dimension Intention to use had a noteworthy impact on user satisfaction. Users utilized the desired services such as IFMIS and MS Outlook. The Information provided by the e-Government systems was illustrated based on users' needs, letting users to promptly obtain the information or services sought. Users located and completed transactions with ease, thus increasing their intention to utilize and adopt e-Government systems. According to the 7NDP (2017), empirical evidence of Zambia's performance in the utilisation of ICT as evidenced in indices produced by various international organisations is poor. This study is agreeable to that statement in regard to applications such as Skype for Business and Share Point which the researchers found that the utilisation levels of these two applications by government employees were very low.

### 4.4.5 Change Management

Prosci.com (2019), states that "change management is the discipline that guides how to prepare, equip and support individuals to successfully adopt change in order to drive organizational success and outcomes." While all changes are unique and all individuals are unique, decades of research show there are actions that can be taken to influence people in their individual transitions. Change management provides a structured approach for supporting the individuals in the organization to move from their own current states to their own future states.

The study found that the variables used in change management questionnaire were valid. There is no literature, however, which has conducted research to measure change management using IS Success models. Cronbach's alpha tests were used to check whether multiple-question Likert scale surveys were reliable, and the study observed that the designed tests were accurately measuring the variable of interest. The study further found that the correlation coefficient amongst the variables in change management dimension was questionable, of which other literature would regard as moderate. For the Pearson correlation used in this study, a value close to 1 indicated a perfect linear relationship, however, there were lots of correlations close to 0 which indicated that there was a little linear relationship between the variables. On the overall, the results showed that the p-value for the correlation level was significant. Therefore, change management impacts user satisfaction significantly.

This study has contributed to the body of knowledge by incorporating a change management construct on the IS success model. The reliability and validity of the variables on a change management construct were found to be significant. The study designed its own model known as e-Government assessment model, future researchers are encouraged to test this model to prove its effectiveness.

Findings in this study suggest that government employees were trained in Microsoft Outlook and IFMIS. Most of the respondents mentioned that they never received training in Skype for Business and Share Point. Some respondents did not know as to whether the e-Government services were making their job easier or not. The reasons that came out as the cause for such attitude were lack of change management. Other respondents did not find the e-Government services useful in their jobs because they did not know how to use them, whilst others said the services were not available in their institutions and that they were not secure nor reliable. This caused the government employee to resist using applications which they were not familiar with. Training on the newly acquired systems is vital. Training should not only be conducted once but it is an on-going venture until participants fully grasp the concept. The goal of the SMART Zambia agenda is to attain economic and social change by embracing an outlook change from traditional approaches of delivering services (Smart Zambia Plan, 2018).

The e-Government Implementation and Strategic Plan (2013)'s strategic goal is to undertake a comprehensive change management and human resources development programme. Change

Management (CM) ensures that government employees adapt to the changes brought by the introduction of e-Government. CM is a new construct introduced in this study to assess the behaviours and attitudes of users' dependency on e-Government systems. The importance of CM is to; minimize on the resistance that may occur in the change process, enhance on the performance of the end-users, enhance innovation amongst the end-users, inform stakeholders/users on the benefits of the change being implemented, create awareness, desire to change, acquire knowledge, ability to change and reinforce change, value realization and end-users to use the system.

### 4.4.6   User Satisfaction

According to prominent researchers such as DeLone and McLean (2003), user satisfaction is a significant measure of information system success. User satisfaction is the attitude of users to the computer system they employ in the context of their work environments. It is the opinion of the user about a specific computer application, which they use.

A study by Mullany et al. (2006) showed that during the life of a system, satisfaction from users will on the average increase in time as the users' experiences with the system increase. They thus define user satisfaction as the deficiency of user displeasure and grievance, as assessed by users who have had at least some experience of using the system. Alternatively, satisfaction is focussed on experience in the use of a system. Motivation, equally, is based on opinions about the future use of the system.

The investigation in this study uncovered the importance of User Satisfaction in relation to the three quality dimensions, Use/Intention to Use and Change Management. User satisfaction was measured in terms of satisfaction with the e-Government systems, quality, and fulfilled expectations. The success dimension user satisfaction signifies the degree to which information systems are contributing to the success of the different stakeholders.

The study investigated the satisfaction of government employees on the utilisation of e-Government systems by observing the ratings of the applications and services such as IFMIS, Microsoft Outlook, Share Point and Skype for Business. The study concluded that the users were more satisfied with Microsoft Outlook and IFMIS. The study further examined the users' perception of the quality of e-Government systems provided, it was found that Microsoft Outlook and IFMIS were regarded as systems of high quality. The study also investigated whether the e-

Government systems met their expectations, according to the results obtained, the majority responded positively. The study found that government employees who use IFMIS were more experienced with information in the system and satisfied with certain services provided by IS staff.

The overall results showed that government employees were more satisfied with MS Outlook and IFMIS. The study agreed with Stefanovic *et al.* (2016) who found that intention to use/use had a positive and direct effect on user satisfaction. Both intention to use/use and user satisfaction were significant in predicting net benefits. However, this study discovered the dissatisfaction of government employees on Share Point and Skype for Business. The investigations of the study propose that, in order to increase user' satisfaction in regard to the e-Government systems, it is critical for the e-Government coordinating institution to develop or provide the systems that deliver highly specialized quality, usable, user-friendly, and warrant that services are desired for government employees (Smart Zambia Master Plan, 2018).

Users of the systems, in this context government employees' satisfaction towards e-Government applications, could intensify their user satisfaction and make them to be more effective. The more government employees are satisfied with e-Government systems, the more they would have the desire to use them. Management Study Guide.com (2019) state that frequent use of the products offered by an organisation indicates user satisfaction. Customers, in this context government employees, could be disgruntled when their expectations are not met or the commitments from IS providers are not fulfilled reasonably and within the given time span. This becomes a serious issue for the customers as the delay will obviously affect their image too.

Urbach and Mueller (2012), state that the success dimension user satisfaction comprises the user's level of satisfaction when using an information system. It is regarded as one of the most significant measures of information system success. Measuring user satisfaction becomes especially useful when the use of an information system is mandatory, and the amount of use is not a suitable indicator of systems success.

## 4.5    Implications for Theory

This study has contributed to the body of knowledge by extending the IS success model for Zambia's civil service use to include a construct change management and testing it in the utilisation of e-Government systems. First, this study reveals that change management will be affected by

system quality, information quality and service quality. Secondly, change management will impact use/intention to use and user satisfaction. Also, this study is among very few, which has integrated and analyzed the effects of the quality dimensions on change management and the effects of change management on the intention to use/use and user satisfaction. This would allow researchers to understand the significance of added aspects in assessing e-Government systems in the e-Government context.

**Implications for practice**

Since it is one of the very first assessments of e-Government systems in Zambia, the results of this research have significant implications for the Zambian civil service government providing various electronic services. For example, change management on a new and available e-Government service is found to have a significant impact on users' satisfaction which indicates that it is very important for e-Government project success.

The association amongst the variables in the service quality dimension was not supported by the initial correlation analysis. This is because there was no relationship between the data sets. This indicates that information system providers and the e-Government coordinating division should put in more efforts to understand users' expectations when designing services in order to meet stakeholders' expectations. The United Nations (2018) report that Government employees' expectations are plainly to deliver what they need to help in their daily operations. If the level of expectation is provided, then employees would be satisfied.

## 4.6    Summary

This chapter discussed the results of the research and their analysis. The data presented was gathered using structured interviews and questionnaires. The presentation of the results was done using tables and charts. Findings from the qualitative and quantitative data were compared, interpreted and discussed to provide a recommendation. The next chapter of the study provides conclusions and recommendations.

## CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

## 5.1    Introduction

The previous chapter illustrated the presentation of the results collected from the field. The study applied semi-structured interviews and a questionnaire survey to collect primary data. The data was analysed, and the results were presented in form of bar charts, pie charts, tables and narrations. This chapter presents the conclusions of the study drawn from the research objective. The Chapter further outlines recommendations which could improve the utilization of e-Government systems by government employees This concluding chapter further features limitations of the research study and points out areas for further research.

## 5.2    Conclusions

The objective of the study was to assess the utilisation of e-Government systems by government employees in Zambia. The methodology for assessing the usage of e-Government systems was done through a modified e-Government Assessment Model. The modified model gives important insight into how well the government employees are utilizing the e-Government systems.

All the objectives of this study were achieved. The conclusion is discussed in the following sections in line with the specific objectives of the study.

### 5.2.1   Performance of the e-Government System in terms of System Quality and Information Quality

The performance of e-Government systems was measured, the results from the questionnaire survey indicated that the performance of e-Government systems quality was rated as 'good' at 55.6%, seconded by 'fair' at 34.4%. The findings of this study confirmed that System Quality was the most valued among the quality dimensions. The research discovered that if a system is user friendly, employees have the desire to use the system. This corresponds with the results from the research interviews which presented that; 11 out of 12 participants interviewed were happy with the system quality of Microsoft Outlook and whilst 9 out of 12 expressed satisfaction with IFMIS, however, 7 out 12 and 9 out of 12 were dissatisfied with Skype for Business and Share Point respectively. Other desired services mostly mentioned in the interviews were e-Payslip, GWAN, e-Cabinet and Internet Services.

In regard to e-Government systems information quality, most of the respondents agreed at 51.1% that the e-Government systems produce accurate, sufficient and reliable information. The results from the interviews showed that 9 out of 12 candidates agreed that the performance of IFMIS was good.

### 5.2.2 Service Quality from Information Systems Providers and Readiness of Personnel in the Use of e-Government Systems

The study found that e-Government system providers do not meet government workers' needs in regard to individual attention, understanding specific needs, secure and protect privacy and availability of services. In general, 41.1% of the respondents were not satisfied with the e-Government service quality, however, 32.2% felt satisfied. The number of those who were not sure was equally high averaging 26.7%. There is a need to find further as to why this percentage of government staff was not too sure of e-Government services provided.

On the contrary, results from the interviews showed that 11 out of 12 and 9 out of 12 participants stated that Microsoft Outlook and IFMIS respectively were services that were delivered successfully by IS providers. Participants, however, expressed concerns regarding Skype for Business and Share Point, they mentioned that these two services were underutilised. In terms of the systems being secure and protecting privacy, participants had divergence views, 5 out of 12 participants expressed doubts regarding the provision of security and privacy.

The disparities from the qualitative and quantitative data could be due to Skype for Business and Share Point which underperformed during the quantitative analysis.

### 5.2.3 Behaviour and Attitude of Users' Dependency on e-Government Systems

The results show that government employees' dependency on e-Government systems were rated as moderate at 65.6% and high at 28.9%. On the overall, the 'intention to use/use' of the e-Government systems by government employees was moderate. There is a need to further improve the utilization of these systems in order to maximize the productivity of government services. The majority of the government employees did not have the capacity to utilize Skype for Business and Share Point and were rarely used at 44% and 69% respectively. This corresponded with the results from the interviews; 7 out of 12 and 9 out of 12 participants said that Share Point and Skype for Business respectively, frequency of use was low due to lack of capacity in the utilization as well

as lack of training. However, most participants mentioned that Internet services, government e-Mail Outlook, and e-Payslip were frequently used and that their dependency was on IFMIS, Internet Services, GWAN, Microsoft Office applications and, e-Government Websites.

### 5.2.4 Government Employees' General Satisfaction with the e-Government Applications.

The results on the general satisfaction of the government employees with the e-Government applications show that Microsoft Outlook was the most appreciated service which was rated on average at 34%, seconded by IFMIS at 31%. Skype for Business was rated at 15% whilst Share Point was at 13%. This was in line with the results from the interviews were 10 out of 12 and 9 out of 12 participants mentioned that they were satisfied Microsoft Outlook and IFMIS respectively and that these two systems were of high quality. However, in as much as Skype for Business and Share Point were of high quality, these services were appreciated by 4 out of 12 participants on average. This was because orientation on these services was not adequately done. The more the government employees use systems the more they would be satisfied.

Further results in the study indicated that 64.4% of the respondents agreed that they were aware of e-Government systems and that they received their training on these systems. However, 15.6% were not aware of the e-Government systems and were not trained whilst 18.9% were not sure. This implied that government employees had some degree of awareness and received formal training on the utilization of specific systems and services. Results from the interviews indicated that awareness of Microsoft Outlook and IFMIS was high in the government and were rated 12 out of 12, and 11 out 12 respectively. However, employees needed to be aware and be trained in Skype for business and Share Point.

### 5.2 Recommendations

The following are the key recommendations aimed at improving the utilization of e-Government systems by government employees:

a) The e-Government Coordinating Division need to enhance quality, this will ensure that productivity is improved. In addition, the coordinating division need to create continuous purpose towards improvement of systems and services; put emphasis on long term requirements rather than short term objectives;

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b) In order to deliver good quality services, Information Systems providers need to understand users' expectations when designing services to meet those expectations. Government employees' expectations are plainly to deliver what they need to help in their daily operations. If the level of expectation is provided, then employees would be satisfied;

c) To have a value realization of e-Government systems, e-Government Coordinating Division needs to develop such systems that have a significant level of usability and convenience. The e-Government Coordinating Division needs to pay attention during the acquisition and development stage to IQ, SQ, and SV in order to impact 'intention to use/use', and the US of government employees, which could advantage greater success of e-Government systems.

d) Share Point and Skype for Business are high-quality systems, but most of the government employees do not see the value because change management was not adequately done. Information System (IS) personnel should ensure that change management is adequately done

e) IS personnel should put up a sensitization campaign, training in Share Point and Skype for Business, a coaching plan should be made to ensure that all implemented services are secure, available and address specific needs of the user;

f) e-Government Coordinating Division should consult stakeholders especially govt employees before the acquisition of systems so that the user expectations are met;

g) e-Government Coordinating Division need to conduct intensive change management activities to ensure that systems are adopted in order to have a value realization from the investments made on such systems;

h) e-Government Coordinating Division should adopt ISO 9001:2015 standards to ensure that the system qualities of the e-Government systems are internationally recognised.

i) The e-Government coordinating division and government employees are encouraged to implement in their practices the qualities presented in this research that can enhance the utilization of e-Government Systems;

j) There is a need to continuously monitor the qualities and continuous improvements of the e-Government systems.

## 5.3    Limitations of the study

The study had limitations that need to be taken into consideration when interpreting the reported findings such as:

a) administrative policies that prohibited collecting data in some sites was due to non-availability of the ethical clearance. The ethical clearance was delayed in issuance from DRGS, hence certain institutions refused to provide data without the ethical clearance;

b) the study used an online google form to capture the survey data. A questionnaire was sent to provided e-mail addresses, but some responses were not received probably due to technicalities with the utilisation of the form;

c) the online questionnaire was sent randomly using the provided email addresses. Therefore, some targeted respondents chose not to respond due to some reasons;

d) scarcity of literature on IS Change Management, e-Government systems are exposed to a constant change;

e) the discussed findings and their implications were obtained from one single study that examined some particular e-Government systems and targeted a specific government employees group in Zambia. Thus, caution needs to be taken when generalizing these findings and in the discussion of other e-Government categories or user groups. It is imperative that the proposed model be validated in different user populations and different e-Government contexts, especially in G2B and G2Gcontexts;

f) the sample size used is another limitation of this study. A cross-cultural validation using a large sample gathered elsewhere is required for greater generalization of the proposed model. Restriction of the targeted population to Lusaka, though Lusaka has higher numbers of civil servants in the targeted ministries, opinions from members in rural or non-urbanized settings should have been obtained. In addition, sampling according to provinces could have shown discrepancies or similarities of findings; and

g) though information regarding gender of participants or respondents was collected under demographic data, findings were not disaggregated to gender. It was felt that this was beyond the scope of this study and could be an area of further research.

Because of time, scope and financial constraints the stated limitation could be considered as areas for further research.

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**7.0    APPENDICES**

## APPENDIX A:     INTERVIEW DISCUSSION GUIDE

Ministry/Institution……………………………………………….…………..

Department…………………………………………………………………

Designation………………………………………………..……………….

Years of Working……………………………………….……………………

Highest Qualification……………………………………………………..

| | Objective | Questions | Investigations |
|---|---|---|---|
| 1 | To measure performance of the e-Government systems of system and information quality | Describe how the systems perform in terms of usability and output? | 1. User-friendliness of e-Gov systems<br>2. e-Gov systems provision of desired services<br>3. e-Gov systems provision of accurate information<br>4. e-Gov systems provision of sufficient information<br>5. e-Gov systems provision of reliable information<br>6. Information content of the e-Gov system fit your needs |
| 1.1 | | | |
| 2 | To measure the readiness of personnel in the use of e-Government systems and assess the services provided by IS | How can we ensure that the government employees are ready in the utilization of e-Government Systems and how can IS providers give quality services | 1. e-Gov systems ready to help<br>2. Transactions within the e-Gov system and issues on security and privacy<br>3. Availability of e-Gov systems<br>4. IS providers give individual attention<br>5. IS providers understand specific needs |
| 2.1 | | | |

| | Objective | Questions | Investigations |
|---|---|---|---|
| 3 | To assess the behaviour and attitude of users' dependency on the e-Government systems. | What are the behaviours and attitudes of users in regard to dependency on the e-Government system, frequency of system use, as well as tendency and duration of future use? | 1. Dependency on the e-Gov systems<br>2. Frequency of use of the e-Gov system |
| 3.1 | | | |
| 4 | To evaluate the government employees' general satisfaction with the e-Government applications. | i. How do the e-Government systems contribute to the success of individual employee?<br>ii. Describe government employees' general satisfaction with the e-Government systems. | 1. Awareness on the e-Gov Systems<br>2. Training in the e-Gov systems<br>3. Ability to use e-Gov Systems<br>1. Satisfaction with the e-Gov systems<br>2. Quality of e-Gov system and services<br>3. Expectations on e-Gov systems |
| 4.1 | | | |

**APPENDIX B:        SURVEY QUESTIONNAIRE**

**A QUESTIONAIRE TO GATHER INFORMATION TO ASSESS THE UTILISATION OF E-GOVERNMENT SYSTEMS BY THE GOVERNMENT EMPLOYEES**

This serves to inform and assure you that the information you are providing in this questionnaire will be used largely for academic purposes as well as in line with research ethics such as upholding of confidentiality, anonymity etc. Please tick(s) [√] for the correct answer(s).

## SECTION A – DEMOGRAPHIC CONDITIONS

[1].    **Date**: ___/ ___/ _____

[2].    **Gender:**

   a)     Male          [ ]
   b)     Female        [ ]

[3].    **Your Designation**:_____

[4].    **Name of Ministry/Institution**:_____

   _____

 [5].    **Department**:_____

[6].    **Respondent's Designation**:_____

[7].    **Education**:

   a)     Certificate              [ ]
   b)     Diploma                  [ ]
   c)     Bachelor                 [ ]
   d)     Masters                  [ ]
   d)     PhD                      [ ]

[8].    **Work Experience**:_____

   a)     3 - 5              [ ]
   b)     6 - 8              [ ]
   c)     9 - 11             [ ]
   d)     Over 12 Years      [ ]

[9].    **What is your Current Age Group**:_____

       a)     18 - 24            [ ]
       b)     25 – 34            [ ]
       c)     35 - 44            [ ]
       d)     45 - 54            [ ]
       e)     55 - 64            [ ]
       b)     65 Years & above   [ ]

## SECTION B – SYSTEM QUALITY

[1]    How would you rate the user-friendliness of the following services:

a)    Microsoft Outlook

    [ ]    Excellent
    [ ]    Good
    [ ]    Fair
    [ ]    Poor
    [ ]    I Don't Know

b)    Skype for Business

    [ ]    Excellent
    [ ]    Good
    [ ]    Fair
    [ ]    Poor
    [ ]    I Don't Know

c)    Share Point

    [ ]    Excellent
    [ ]    Good
    [ ]    Fair
    [ ]    Poor
    [ ]    I Don't Know

d)    IFMIS

    [ ]    Excellent
    [ ]    Good
    [ ]    Fair
    [ ]    Poor
    [ ]    I Don't Know

[2]  At what extent do the following services/system provide desired services

a)  Microsoft Outlook

[ ]  Excellent
[ ]  Good
[ ]  Fair
[ ]  Poor
[ ]  I Don't Know

b)  Skype for Business

[ ]  Excellent
[ ]  Good
[ ]  Fair
[ ]  Poor
[ ]  I Don't Know

c)  Share Point

[ ]  Excellent
[ ]  Good
[ ]  Fair
[ ]  Poor
[ ]  I Don't Know

[d]  IFMIS

[ ]  Excellent
[ ]  Good
[ ]  Fair
[ ]  Poor
[ ]  I Don't Know

## SECTION C – INFORMATION QUALITY

[1]  Does the IFMIS system provide accurate information

[ ]  Yes
[ ]  No
[ ]  Maybe
[ ]  Not Applicable
[ ]  I Don't Know

[2]     Does the IFMIS system provide sufficient information

      [ ]     Yes
      [ ]     No
      [ ]     Maybe
      [ ]     Not Applicable
      [ ]     I Don't Know


[3]     Does the IFMIS system provide precise information

      [ ]     Yes
      [ ]     No
      [ ]     Maybe
      [ ]     Not Applicable
      [ ]     I Don't Know


[4]     Does the IFMIS system provide reliable information

      [ ]     Yes
      [ ]     No
      [ ]     Maybe
      [ ]     Not Applicable
      [ ]     I Don't Know

[5]     Which of the following shared services fit your organizational needs. (*You can select more than one answer*).

      [ ]     Microsoft Outlook
      [ ]     Skype for Business
      [ ]     Share Point
      [ ]     IFMIS
      [ ]     Not Sure


## SECTION D – SERVICE QUALITY

[1]     Which of the following shared services is always ready to help in your daily duties. (*Pick more than one (1) answer*).

      [ ]     Microsoft Outlook
      [ ]     Skype for Business
      [ ]     Share Point
      [ ]     IFMIS
      [ ]     Not Sure

[2]    Are transactions within the shared services mentioned in [1] secure and protect privacy?

    [ ]    Yes
    [ ]    No
    [ ]    Maybe
    [ ]    I don't Know


[3]    Are the shared services mentioned in [1] available at all times?

    [ ]    Yes
    [ ]    No
    [ ]    Maybe
    [ ]    I don't Know

[4]    If the answer in [3] is 'No' state which service is not available at all times?

    [ ]    Microsoft Outlook
    [ ]    Skype for Business
    [ ]    Share Point
    [ ]    IFMIS
    [ ]    Not Sure

[5]    Do the e-Government system providers give you individual attention?

    [ ]    Yes
    [ ]    No
    [ ]    Maybe
    [ ]    I Don't Know

[6]    Of the following e-Government systems, which one does NOT give you individual/organization attention?

    [ ]    Microsoft Outlook
    [ ]    Skype for Business
    [ ]    Share Point
    [ ]    IFMIS
    [ ]    Not Sure

[7]    Do the e-Government systems providers understand your specific needs
    [ ]    Yes
    [ ]    No
    [ ]    Maybe
    [ ]    I Don't Know

[7]    If the answer above is 'No' or 'Don't Know' state the reason why the providers do not understand your specific needs. (Pick more than one answer).

[ ]    Instability of the systems
[ ]    They are not dependable
[ ]    I do not know how to use them
[ ]    They are not always available

## SECTION E – INTENTION TO USE/USE

[1]    At the rate of **[1,2,3,4]**, rate the dependability of the following services in your organisation: (*1 is high and 4 is low*).

[ ]    Microsoft Outlook
[ ]    Skype for Business
[ ]    Share Point
[ ]    IFMIS
[ ]    Not Sure

[2]    Rate the frequency of use with the following shared services in your organisation; (*1 is high and 4 is low*).

[ ]    Microsoft Outlook
[ ]    Skype for Business
[ ]    Share Point
[ ]    IFMIS
[ ]    Not Sure

[3]    Which of the following shared services don't you use in your organization? (*Pick more than one (1) answer*).

[ ]    Microsoft Outlook
[ ]    Skype for Business
[ ]    Share Point
[ ]    IFMIS

[4]    Which of the following shared services/system is the most important one in your organization? (*Rate your answers between (1 - 4), 1 being the highest and 4 the least*).

[ ]    Microsoft Outlook
[ ]    Skype for Business
[ ]    Share Point
[ ]    IFMIS
[ ]    Not Sure

## SECTION F – CHANGE MANAGEMENT

[1]     Are you aware about the shared services and systems provided by SZI?

[ ]     Yes
[ ]     No
[ ]     Maybe
[ ]     I  Don't Know

[2]     Of the following e-Government Systems, which one are you aware of?

[ ]     Microsoft Outlook
[ ]     Skype for Business
[ ]     Share Point
[ ]     IFMIS

 [3]     Have you ever received any formal training in any of the systems/services mentioned above
[ ]     Yes
[ ]     No
[ ]     Maybe
[ ]     I  Don't Know

[4]     Of the following e-Government Systems, which one were you trained in?

[ ]     Microsoft Outlook
[ ]     Skype for Business
[ ]     Share Point
[ ]     IFMIS
[ ]     Non of the above

[5]     Do the shared services/system mentioned in section (F) make your job easier? (Ability to ustilise systems)

[ ]     Yes
[ ]     No
[ ]     Maybe
[ ]     I  Don't Know

[6]     Are the e-Government Systems provided useful to your job?

[ ]     Yes

[ ]      No
[ ]      Maybe
[ ]      I  Don't Know

## SECTION G – USER SATISFACTION

[1]    Which of the following shared services/system are you satisfied with? (*Pick more than one (1) answer*).

      [ ]      Microsoft Outlook
      [ ]      Skype for Business
      [ ]      Share Point
      [ ]      IFMIS
      [ ]      Not Sure

[2]    Of the following services of the e-Government system which one is of high quality? (*Rate your answers between (1 - 4), 1 being the highest and 4 the least*).

      [ ]      Microsoft Outlook
      [ ]      Skype for Business
      [ ]      Share Point
      [ ]      IFMIS
      [ ]      Not Sure

[3]    Have the e-Government systems mentioned in [2] meet your expectations as an individual/organization?

      [ ]      Yes
      [ ]      No
      [ ]      Maybe
      [ ]      I  Don't Know

[4]    If the answer in [3] is 'No' state which service(s) does not meet your expectations as an individual/organization?

      [ ]      Microsoft Outlook
      [ ]      Skype for Business
      [ ]      Share Point
      [ ]      IFMIS

*Thank you for your participation!*

**APPENDIX C:        CONFERENCE JOURNAL PAPER SUBMISSION**



Dear charles lubobya,

Thank you for submitting your manuscript, #200520-093014, titled "Assessing the Usage of e-Government Systems in Zambia, A Government Employee Perspective," for our review. Your paper will be evaluated by members of our Editorial Review Board, and we will advise you as soon as possible of its publication possibilities as well as any editorial revisions that may be necessary. Please be advised that the review process takes approximately 12-16 weeks. Thank you for your interest in our Journal.

If you have any questions, feel free to contact me, Nripendra Rana, at nrananp@gmail.com.

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